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The Journal
OF
Nervous and Mental Disease
AN AMERICAN JOURNAL OF NEUROPSYCHIATRY

FOUNDED IN 1874

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The Journal

OF

Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

ORIGINAL ARTICLES

ACTION-TREMOR

BY DR. H. DE JONG

FIRST ASSISTANT OF THE CLINIC

In a paper recently published and written in Dutch,¹ I gave the delimitation and the description of action-tremor, expressing my conception that it represents a type, occurring generally and that it should be definitely distinguished from intention-tremor.

I will develop here my arguments for the delimitation of this special type of tremor and I will outline the way in which I hope to work further to get a deeper understanding of the phenomenon of tremor in general.

Clinical investigations, regarding the action of bulbocapnine² made in collaboration with G. Schaltenbrand of Hamburg,³ and comparing experiments on the action of bulbocapnine and other alkaloids, made together with W. Herman of Boston,⁴ gave us the opportunity to examine a large number of cases of paralysis agitans and of other tremor diseases. So we made a great number of tremor records. Hence it seemed to me desirable in defining more exactly the type of shaking met with by paralysis agitans, as no uniformity is present in the description of tremors, other than rest-tremor.

From the neurological clinic of the University of Amsterdam. (Prof. Dr. B. Brouwer.)

¹ Nederl. Tydschrift v. Geneeskunde, January, 1926, pp. 166-174.

² Nederl. Tydschrift v. Geneeskunde, 6, IX, 1924. (Lecture before the Amsterdam Neurol. Society, June, 1924.)

³ Klinische Wochenschrift, 4, XI, 1924; Neurotherapie, 1924, No. 6; Neurotherapie, 1925, Nos. 1 and 2; Deutsche Zschr. f. Nervenheilkunde, Bd. 86, pp. 130-180.

⁴ Will appear in the Archives of Neurology and Psychiatry.

Amsterdam, February, 1926.

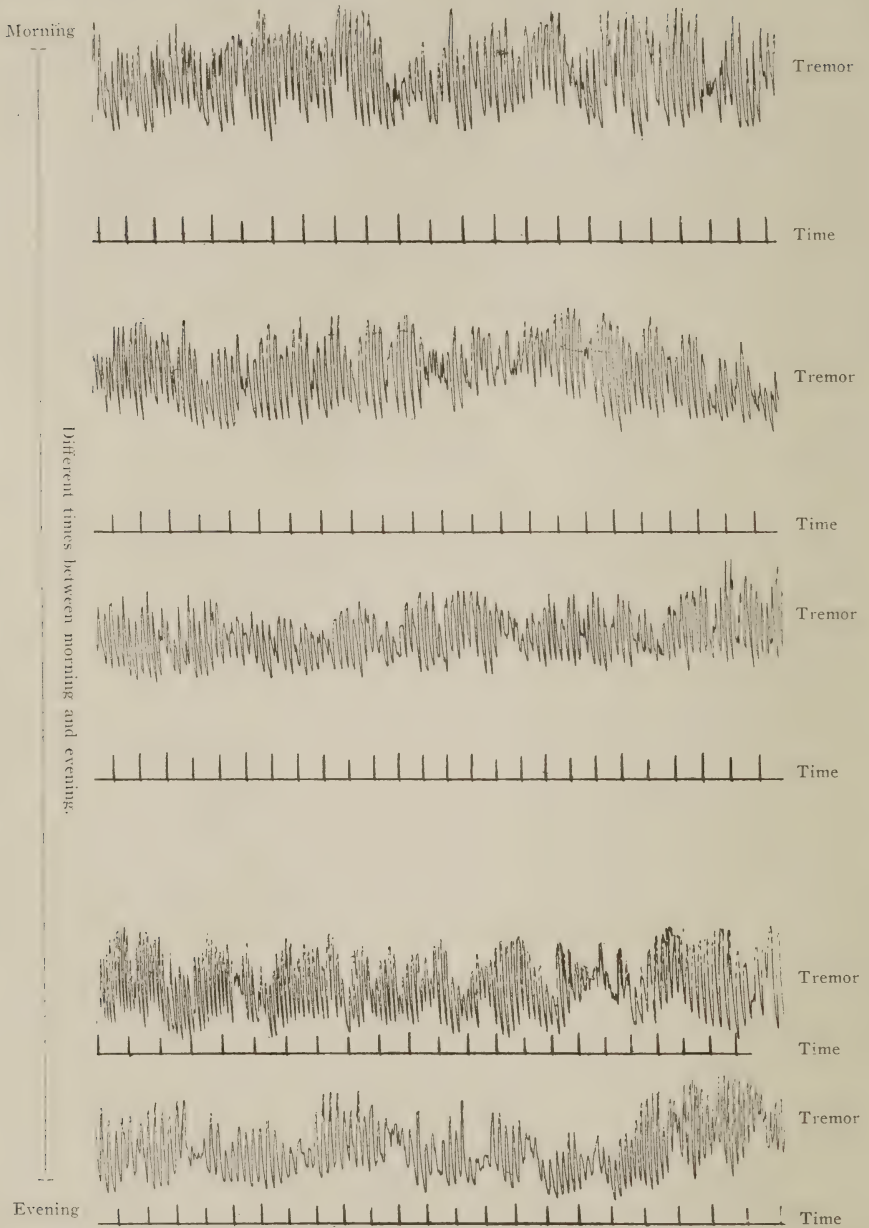


FIG. 1. Patient R. (Severe Paralysis agitans.)

The presence of a so-called rest-tremor is typical in cases of paralysis agitans. *Charcot*, as quoted by *Manschot*⁵ even made the differential diagnosis between shaking palsy and disseminated sclerosis by distinguishing the rest-tremor and the intention-tremor. Later on, however, it appeared that this discrimination could not be so definitely made. It is stated, among other things in *Jelliffe and White's* textbook on Diseases of the Nervous System, that an intention-tremor may occur sometimes also in paralysis agitans. *Lewy*⁶ discussed the appearance of a static (*i.e.*, caused by the special posture of a limb) or of a locomotorial-tremor (caused by movement) in the case of paralysis agitans. It seldom should take the form of an intention-tremor. *Wilson*, in his splendid Croonian Lecture⁷ states that in paralysis agitans rest-tremor as well as action-tremor or intention-tremor are mixed. *Wilson* considers that action-tremor and intention-tremor are identical.

My conception, however, is that action-tremor is just a type for itself, quite different from intention-tremor.

Before developing this subject in more detail, I would like to give here an example of a so-called classical rest-tremor.

Fig. 1 shows five curves of the tremor taken at different periods on the same day. The patient, suffering from a severe form of paralysis agitans of several years' duration, is psychically as well as bodily entirely at rest during the registration.

The method of registration was a special one of our own. It consisted in recording in a simple way on a kymograph the shaking of the thenar muscles by means of a pelotte fastened to the hand with a leather band.⁸

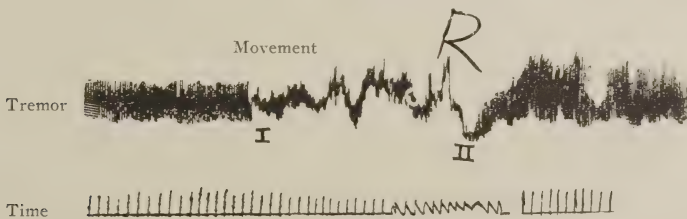


FIG. 2

In Fig. 2 a second characteristic of a rest-tremor is represented: Diminishing of the intensity of the tremor while slight movements

⁵ Psychiatrische en Neurologischen Bladen, 1904.

⁶ Die Lehre vom Tonus und der Bewegung. Springer, 1923.

⁷ Croonian Lectures. The Lancet, July 4, 11, 25, August 1 and 8, 1925.

⁸ See for details Neurotherapie, 1925, and Deutsche Zschr. f. Nervenheilkunde, 1925, Bd. 86.

are made. The patient moves the arm up and down (I-II) while the hand is being registered. The height of amplitude of the rest-tremor decreases while rest begins again at R. But after the stopping of the movements behind the point R the tremor-amplitude is higher than before moving. *Wilson* states a similar phenomenon in the finger-nose test: At first diminution or cessation of the tremor occurs; yet after a moment or two of "rest" on the nose, the finger again becomes agitated. We will explain further on this phenomenon.

Above an example is given of the classical rest-tremor. In Figs. 3 and 4, however, quite a different picture is shown.

These curves have been taken in a patient, who had for very long been under our observation; the final diagnosis was paralysis agitans syndrome due to arteriosclerosis. The syndrome began with an isolated tremor in the right hand and arm, which was never present in rest, but could be aroused for instance by stretching out the arm. (See Fig. 3a.) Fig. 3b indicates the increasing effect on the tremor

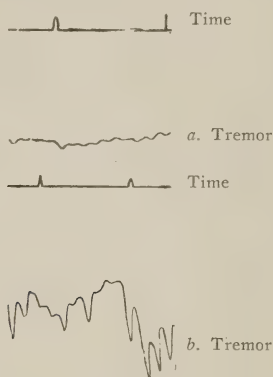


FIG. 3

produced by swinging up and down the outstretched arm. Hence, this tremor contains two of the possibilities mentioned by *Lewy*, viz.: static tremor (by holding the limb in a special attitude) and locomotoric tremor (by moving). After my opinion these two possibilities make up a special entity, which enables us together with further characteristics to be mentioned below, to define a special type of tremor. The patient always maintained the same tremor type, even at the time that a masked face, general rigidity, a flexion type, extension of the tremors to other limbs, etc., facilitated the diagnosis.

In Fig. 4, taken about a year and a half after the registration in Fig. 3, the same *action type of tremor* (as I should like to call this type of tremor) is still present. So it does not belong to the first

stage of the illness. In Fig. 4 at the point R there is no tremor in rest, only the pulse is registered. At the point S the patient stretches out his arm, thus causing a slight tremor, but the maximum extent of the tremor appears when the arm is kept semi-flexed (at the point $\frac{1}{2}$ in the figure).

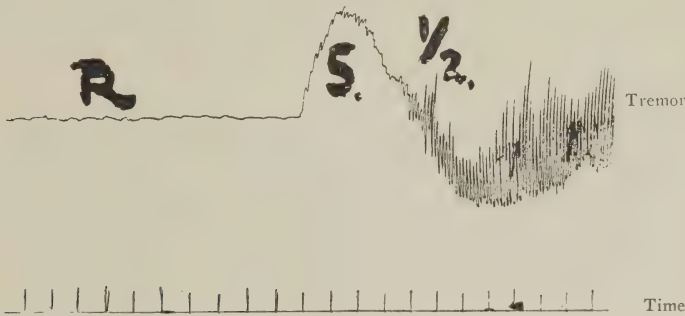


FIG. 4. Action-tremor in case of Paralysis agitans.

As stated, we deal here with a tremor which in contrast to a rest-tremor, does not exist in rest and increases while moving. Any action may bring on the action-tremor, for instance holding the arm half flexed. The same can be said of speaking, reading, emotion, etc.

Some of the properties of the action-tremor are also found in the rest-tremor; viz., the fact that the tremor increases by action or moving of longer duration. In the case of a slight movement, the effect, however, is different in the two kinds of tremor.

The lowering of tremor occurring sometimes in moving can be explained by the fact that the muscular contraction prevents for a short time the tremor from becoming obvious. When, however, the action becomes stronger or lasts a considerable time, the increase of the tremor expresses itself.

In Fig. 5 the occurrence of an action-tremor in a case of cerebellar tremor is shown. In the case of this patient, there was a tumor in the cerebellum, which was also ascertained by trepanning, but the tumor was too big to be removed. This patient showed tremor in the arm homolateral to the tumor. The shake, however, did not exist in rest, but could be aroused by any physical or psychical action engaged in by the patient. In Fig. 5 first an irregular part in the curve is shown, caused by movements in the hand, which was fastened by a bandage to a pelotte, fixed to the back of a chair. At point 7 the tremor in the *right* arm was aroused by letting the patient swing her *left* arm. At point 8 this stimulus is stopped, and the tremor lasts for a time, but is soon reduced to a very low amplitude. In

the next tracings of Fig. 5 the same fact is seen after an injection of 200 mgr. of bulbo-carpine hydrochloride. Here the height of tremor amplitude is diminished and the action character of the tremor (action between 7 and 8) is even more visible. The difference with an intention-tremor, as in disseminated sclerosis, is also very clear, the tremor being aroused by swinging the not-trembling arm.

A very remarkable point is that the rhythm is 6 to 7 per second, being quite the same as in paralysis agitans.

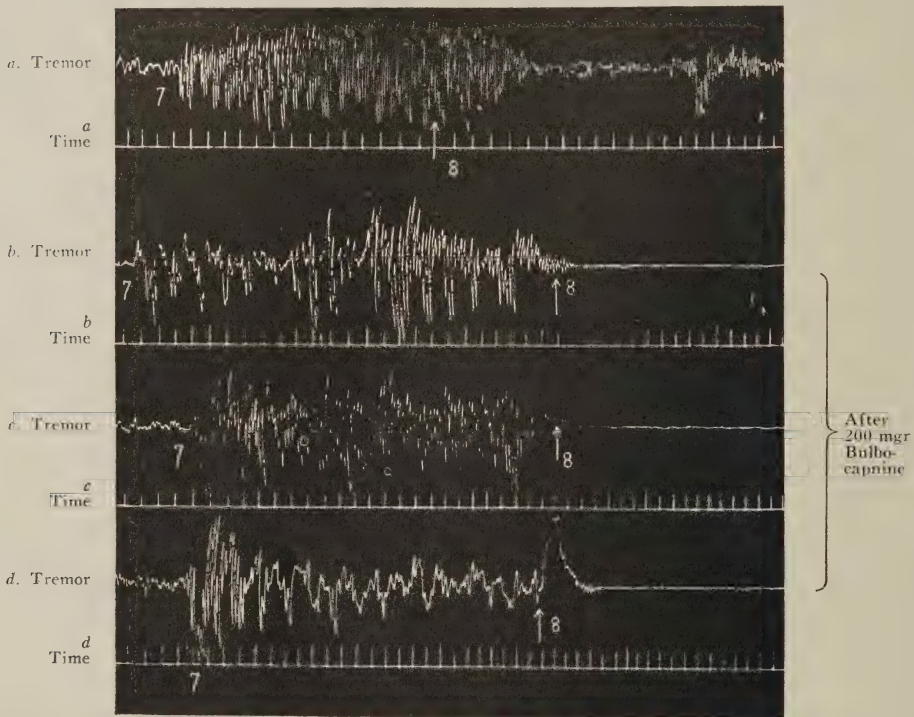


FIG. 5. *Cerebellar Action-Tremor.*

In this connection, it should be noted, that the frequency of the *clonus* may be perfectly the same. The action-tremor type drawn in Fig. 6b even shows a picture quite like that of a clonus curve (See Fig. 7a). The tremor may in Fig. 6 be aroused at will at the point $\frac{1}{2}$, and after the stimulus ceases it immediately stops at the point R. The action-tremor in Fig. 5a, on the other hand, still lasted (although decreased) after the stimulus had stopped. Under the influence of bulbo-carpine, however, the tremor immediately stopped at the point 8 in Fig. 5b, c and d.

Further *action-tremor* may show itself at the all or none presence of *extrapyramidal rigidity*; the *clonus*, however, belongs to a heightened *pyramidal tonus*. In their reaction upon bulbo-capnine clonus and tremor both behave in many regards the same. The action of the clonus under the influence of scopolamine, which also diminishes tremor, is not as yet known. In connection with this problem similar tests should be worth trying.

A very remarkable point is the fact that transitions between rest- and action-tremor are possible and even frequent. We find rather frequently that a patient suffering from paralysis agitans does not tremble when in rest, but following any action, tremors arise which after the stimulus has ceased may continue for a long time. In rest there seems to be a labile equilibrium, which is disturbed by action. Rest-tremor seems to be aroused here by action.

Another kind of transition between rest- and action-tremor shows Fig. 6. This is a very typical case of paralysis agitans: a sixty-two-year-old man, suffering from tremors since about four years. The tremor, however, is periodic, occurring every three to five minutes in rest. In Fig. 6a a smoothly curved line is first seen in rest; at point a quite spontaneously heavy oscillations are visible and also spontaneously after some time they turn into a smooth line again. Now, the remarkable thing, however, is that the curve line being smooth, an action-tremor can be aroused at will, for instance by semi-flexion of the arm (at the points $\frac{1}{2}$ in Fig. 6), where registrations are made by means of a quickly and of a slowly moving kymograph. As soon as the arm is kept in a rest posture (at point R), the curve immediately regains its smooth form again. The similarity between this picture and that of a clonus has been mentioned above.

It may also be seen in Fig. 6 that the action-tremor is caused only by being in action and that it cannot be considered as a sign of fatigue, as the tremor appears in less than a second after the arm has been bent; a time too short for the occurrence of fatigue. Immediately in regaining a rest posture (R's in Fig. 6) the tremor disappears. On the other hand, had the tremor been caused by fatigue, it could not have stopped so quickly, because fatigue naturally needs some time to disappear.

Finally, it is still a problem whether an intention-tremor, as described in cases of disseminated sclerosis occurs in paralysis agitans. As mentioned, some authors (*Jelliffe, White, Lewy, Wilson*) think this is possible. In my opinion, however, it is not possible.

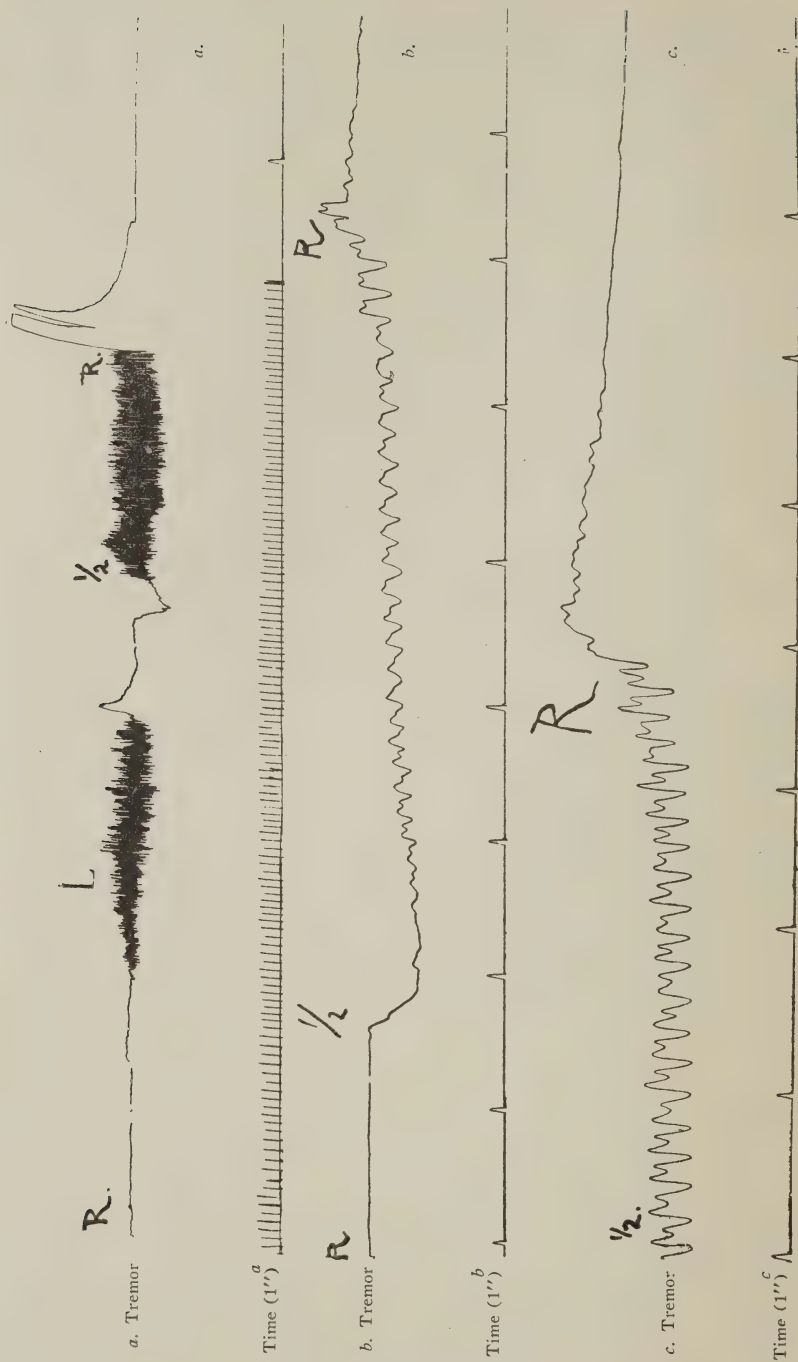


FIG. 6. Paralysis agitans.

From the following list, where I have put the characteristics of action-tremor and of intention-tremor opposite one another, it is at once apparent that the authors mentioned above confused an action-tremor with an intention-tremor. The curve of a typical intention-tremor in a case of disseminated sclerosis is shown in Fig. 7b.

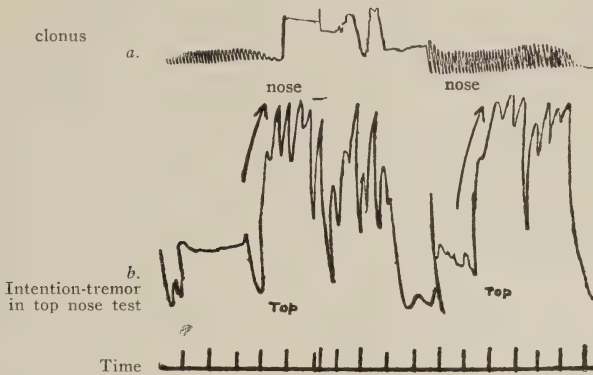


FIG. 7. Pat. Sw. disseminated sclerosis.

<i>Intention-Tremor</i>		<i>Action-Tremor</i>	
I	Locomotorial	I	Static and locomotorial
II	Arises at the end of a movement	II	Arises by any psychical and physical activity.
III	Considerable rhythmical oscillations of unequal amplitude	III	Regular tremor
IV	The whole limb moves around an equilibrium position.	IV	Circumscribed groups of muscles may tremble
V	The frequency 2 per second in the case described.	V	The frequency 5 to 7 per second in the cases here described.

FINAL DISCUSSION OF THE PROBLEM

I hope that I have given a sufficiently definite picture of action-tremor. Now, we have to explain further the fact that such a variety in the striatal tremor is possible, as we find rest-tremor, action-tremor, or combinations and transitions of both types.

Now my conception to this variety can be stated as follows: *All kinds of striatal tremors, including rest-tremors, are action-tremors.* The difference between the several types is only a quantitative but not a qualitative one. Each rest-tremor stops during sleep. We can account for this fact only in supposing that the stimulus given by the state of being awake is sufficient to provoke tremor. I have made the attempt to prove this hypothesis in making the following experiment. The patient R whose enormous rest-tremor

is shown in Fig. 1 has been observed during the sleep. He was totally quiet then. Now, I brought him into a slight action, without awaking him, by changing his right arm's position. He then showed a tremor, first of all in his lips and afterwards in both arms. After a few minutes, he was quiet again. I then awoke him and investigated the patient, whether he had had any sensation of this experiment. He denied, and so we had a more objective fact for our impression that the patient had not been awakened by the impulses, provoked by the experiment.

A second argument for my opinion, that rest-tremor is a very heavy action-tremor, is the following one. In reading *Hall's* monograph on hepatolenticular degeneration,⁹ I got the impression that the tremors here described are action-tremors. I have also in my mind two patients, suffering from Wilson's disease, who showed this type of shaking. Now Hall describes a patient who showed the tremor only in sitting position, but not in the horizontal one. So the fact of sitting on a chair was sufficient to provoke impulses for tremor. Obviously in lying down the patient was in a less active state and produced no tremor. Now it is easy to comprehend how it is possible that the ordinary rest-tremor can be produced in *any* awaking state. We have only to admit that the tendency of shaking is here a maximal one. Only the sleep as an example of relatively inactive state does not give any opportunity for tremor.

My opinion is further that action-tremor is a very frequent phenomenon. We have given here examples in cases of paralysis agitans, cerebellar tremor and Wilson's disease. A normal man too can shake when he performs a considerable strength or under strongly emotional condition (*e.g.*, fear). We consider this tremor as an action-tremor; in a normal individual, however, the action must be very important in order to provoke a tremor. Under pathological conditions this inclination of trembling is increased and in this way we get more easily an action-tremor.

When under certain conditions the inclination of trembling is a maximal one even the awake state means a stimulus for the appearance of the tremor. When sleeping the tremor is abolished, but any increase of consciousness during sleep is able to arouse the tremor.

In other words, we can formulate the above-mentioned conception as follows: *In normal individuals a so-called inclination of trembling is present, but by means of a preventive inhibitory mechanism, it seldom becomes obvious. Under pathological condi-*

⁹ H. C. Hall. La Dégénérescence hépato-lenticulaire.

tions, however, this inhibitory mechanism decreased. So we can consider the tremor mechanism in cases of lesion of the central ganglia, similarly to the extrapyramidal rigidity, which we also explain being caused by an abolishment of inhibitory factors.

In this regard the similarity between clonus and tremor becomes more obvious. Clonus is a phenomenon of rhythmical oscillations occurring in pyramidal hypertonia; tremor is a rhythmical phenomenon in extrapyramidal rigidity. So we are justified to formulate *tremor as an extrapyramidal clonus.*

We hope to verify this conception by further registrations and we will also investigate tremors of other origin (toxic tremors, as in Graves' disease, etc.) in order to see whether the majority of tremors is of the action type.

In this stage of our experiments we can say, anyway, that from all points of view intention-tremor is quite different from action-tremor. The conception of other authors that intention-tremor in cases of Parkinson's disease should be possible is after my opinion not maintainable, as they did not yet distinguish action-tremor from intention-tremor.

INTRACRANIAL ANEURISMS *

REPORT OF A CASE

BY IRVING J. SANDS, M.D.

ASSOCIATE IN NEUROLOGY, COLUMBIA UNIVERSITY; ATTENDING NEUROLOGIST,
JEWISH, BROWNSVILLE AND VETERANS' HOSPITALS; ASSOCIATE
NEUROLOGIST, MONTEFIORE HOSPITAL

Despite the many advances made in the diagnosis of intracranial lesions, the recognition of intracranial aneurisms still remains difficult. Writing on the subject almost seventy years ago, Gull (1) made some valuable remarks which are as pertinent to-day as they were then. He said: "Aneurism of the cerebral vessels has been regarded as a disease of extreme rarity, and judging by the scanty records of it, we should conclude that the opinion was true. This apparent rarity, however, like all negative conclusions, is doubtful, and I think there is the more reason to suspect it as only apparent and due to careless inquiry since the discovery of these cases has been much more frequent during the last ten years. There are several reasons why intracranial aneurism is likely to be overlooked. First of all, as here hinted at, it has not been looked for, and it is notorious that the eye can see only that it bring with it the aptitude to see. Again, when death occurs from rupture of the sac, recent coagula may so imbed and conceal it that unless strictly looked for, it will not be found, for the sac is often small and thin and transparent, except at the point of rupture. Further, also when death has taken place, from changes around the aneurism, as by pressure or softening, the sac itself may present such appearances that unless a minute dissection be made of it, its true nature may not be discovered. Whenever young persons die with symptoms of ingranescent apoplexy, and after death large effusion of blood is found, especially if the effusion is over the surface of the brain in the meshes of the pia mater, the presence of aneurism is probable." Lebert, (2) in a series of papers published in 1866, likewise insisted that a definite diagnosis of cerebral aneurism was possible. He stressed the relationship of heart disease to intracranial aneurisms.

Of the modern observers, Beadles (3) made an exhaustive study

*From the Pathological Department of the Brooklyn Jewish Hospital, N. Lederer, Director.

of the subject. After a careful analysis of 555 cases he frankly stated "the conclusion that I have been forced to draw from a careful

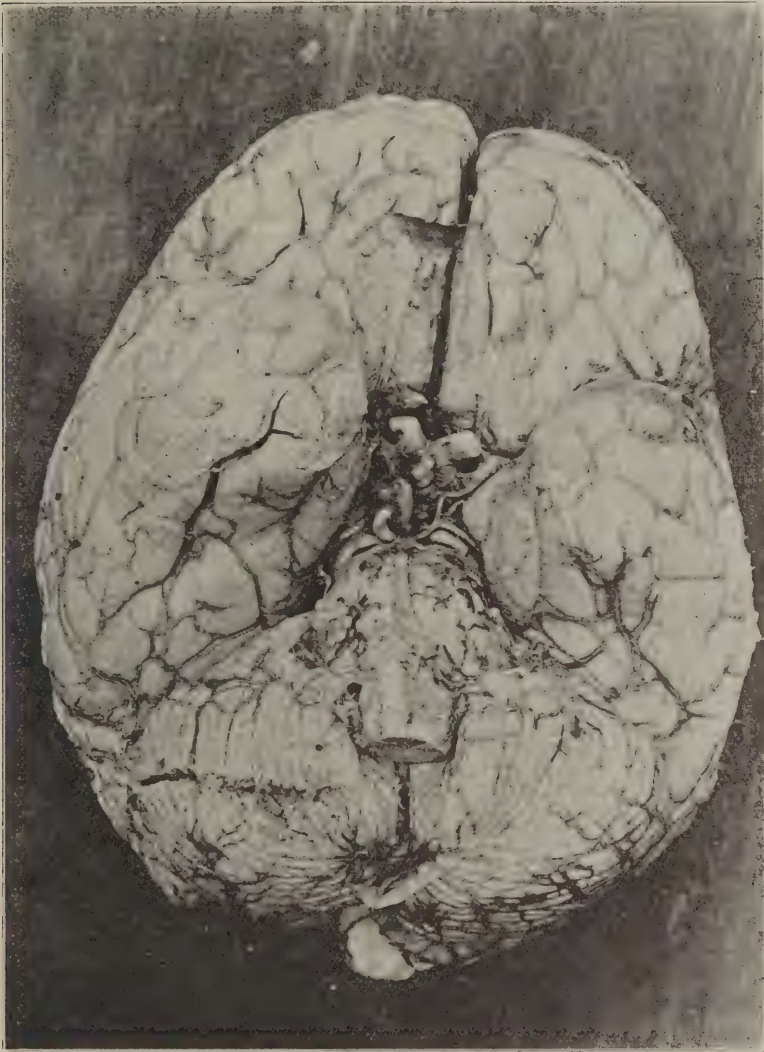


FIG. 1. Showing aneurism of the right posterior communicating artery of the Circle of Willis compromising the right oculomotor nerve and the right peduncle.

study of a large number of cases, is that it is quite impossible to diagnose an aneurism of any one of the cerebral arteries except in the most unusual circumstances. . . . I will go further and say that:

in the vast majority of cases of aneurism a tumor even cannot be diagnosed. If there is any one sign to which special attention might be drawn, it is the occasional intermittent character of the symptoms." He made valuable observations worthy of comment. Thus he found that a correct diagnosis could not always be made from the side on which the signs were most prominent, or on which alone they were most present. Vertigo and dizziness were very inconstant, and headache was only occasionally present. The position of the pain in the head did not seem to have a constant relation to the site of the aneurism. Deafness, on the other hand, was occasionally a leading symptom. Those vessels in direct contact with cranial nerves were the ones that gave symptoms. Thus one-half of the patients with aneurisms of the basilar artery gave symptoms apart from those of final apoplexy. Forty-seven per cent of the patients with aneurisms of the posterior communicating vessels gave symptoms referable to compromise of the third nerves. Forty-one per cent of the posterior cerebral vessels gave symptoms, and a large number of them were embolic in nature. Only 22 per cent of the middle cerebral aneurisms were associated with symptoms as that vessel is away from cranial nerve roots. The anterior cerebral and anterior communicating arteries aneurisms were rarely associated with symptoms as they are most distant from cranial nerves. For similar reasons, aneurisms of the cavernous portion of the internal carotid artery were associated with symptoms in 69 per cent of cases. The aneurisms of the intracranial portion of the internal carotid were associated with symptoms in 31 per cent of cases, and symptoms were referable to the second or third nerve.

Fearnside (4) collected 44 cases of intracranial aneurisms in 5,432 postmortems in which the head was investigated. He divided his cases into a noninflammatory group and an infective embolic group. In the noninflammatory group, a congenital weakness of the arterial wall at junctional points was an important etiological factor. This group was likewise associated with high blood pressure, cardiac hypertrophy and other evidence of general arterial disease. Of thirteen cases of aneurism of the cerebral arteries due to infective emboli, ten cases were associated with ulcerative progressive endocarditis, and in five cases, a positive blood culture was obtained, but in two cases the onset of nervous manifestations first caused the patients to seek admission to a hospital. No example of aneurism due to or associated with a syphilitic infection occurred, while 96.2 per cent of aortic aneurisms were due to weakening of the arterial walls set up by the activity of the syphilitic virus.

A most noteworthy contribution to this subject was recently made by Symonds.(5) He recorded the histories of five cases diagnosed at the bedside as intracranial aneurism cases. In three out of five the diagnosis was confirmed at postmortem examination. The two remaining patients were still alive at the time of his report. He divides the symptoms and clinical signs into three divisions:

1. Those due to mechanical pressure upon surrounding structure, such as cranial nerve lesions, hemianopsia, etc.
2. Those due to disease which was the primary cause of the aneurism, as infective endocarditis, arteriosclerosis, etc.
3. Those peculiar to the presence of the aneurism itself, *i.e.*, leakage of blood.

Symonds' observations and studies interested Cushing (6) to the extent of commenting upon Symonds' work, and he called attention to the fact that most of the patients find themselves in neurosurgical clinics. Our case presented typical signs and symptoms that fit quite well the picture described by Symonds.

A. K. Hospital No. 75667, admitted November 25, and died December 24. Female, white, thirty-four. Native born. Married and a mother of four children. She had a common school education. Her habits were excellent. At twenty-three she married and she gave birth to four healthy children. There was no history of any venereal disease, drugs or alcoholism. She was never ill before. Her family history was negative. Her present illness dated to November 7, when she complained of diplopia, and was unable to raise her right eyelid. She had headaches, pain and weakness in back and in extremities. She consulted several private physicians and also the clinic of New York Eye and Ear Infirmary. She was advised to have her teeth extracted and this was done November 18. On November 25, she went to bed as usual, and with her usual complaint of headache and weakness. At ten o'clock her husband noted that she was very restless, tossed about in bed, moaned a good deal and her breathing was labored. He tried to arouse her but she would not respond. An ambulance was called and she was taken to the hospital. On admission the patient was described as well developed and well nourished. Heart and lungs were negative. Skin was cold and clammy. Pulse was 100 and of good quality. Respirations 20-24. There was a left facial paralysis, face being drawn to the right. Ptosis of right eyelid. Absent right corneal reflex. Right eyeball turned to right. Dilated right pupil which did not react to light. Left eyelid was normal. Left eyeball moved normally. Left pupil smaller than right and reacted promptly to light. Left corneal reflex present. Left extremities paralyzed. Right extremities normal. Left biceps, triceps, knee jerks and ankle jerks were increased, four plus, while the corre-

sponding reflexes on the right were normal, two plus. Left abdominals were absent and the right abdominals were present. Left ankle clonus. Left Babinski, Oppenheim and Chaddock. Left side of chest failed to expand on inspiration. Patient was unconscious and could not be aroused. On November 26, her general condition remained unchanged; she still showed a superior alternating hemiplegia with paralysis of the right third cranial nerve and the left side of the body including left side of the face (Weber's syndrome). Blood Wassermann was reported as negative. Blood chemistry report showed sugar 0.107 per cent. Creatinine 1.9. Urine was acid, sp. gr. 1.032. Trace of albumin, no sugar and a few w. b. c. Blood pressure 150/100. Blood count was normal. She was still in a deep coma. Heart and lungs were negative. Incontinence of urine and feces. On November 27, her condition improved. She attempted to speak and called nurse "Katie." She attempted to sit up. A lumbar puncture was done, and 12 c.c. of bloody spinal fluid was obtained under three plus pressure. Wassermann of fluid was reported negative. The fluid was too bloody to permit other tests. On November 28, her mental condition was greatly improved. She responded to questions readily and asked for her family. An eye examination revealed complete right oculomotor paralysis. There was ptosis, dilated and fixed pupil, and paralysis of the superior internal and inferior recti muscles, the eye being rotated to the right. Right corneal was present. Left pupil was normal and responded normally to light and accommodation. The eye-grounds showed moderately advanced arteriosclerotic changes. There was paresis of the left face and of left side of body, but there was no pathological reflexes present. Her condition continued to improve. On December 2 she suddenly became comatose again. She could not be aroused. There was cervical rigidity. Reflexes on that day were normal. A lumbar puncture was performed and bloody fluid was obtained. She continued to sink. There was marked cervical rigidity and bilateral Kernig. There was evidence of developing pneumonia in the left lower lobe with dullness, diminished breath sounds and definite rales. The respirations went up to 60 on December 4, and she finally died on the same day.

Autopsy No. 197. On incising the dura, there was definite free blood in the right side, above the tentorium. On removal of the brain blood was seen extending into the spinal subarachnoid space. There was an aneurism of the right posterior communicating artery of the Circle of Willis, partly filled with a clot, which had ruptured. The right oculomotor nerve was somewhat thinner than the left, was yellowish in color and was pressed upon by the aneurism. The aneurism evidently pressed also upon the right peduncle. The rest of the postmortem examination disclosed left lobar pneumonia and congestion of the right lung, spleen and liver.

SUMMARY

1. Intracranial aneurisms must be thought of when there are signs of pressure upon brain tissue.
2. A bloody spinal fluid with cervical rigidity and Kernig together with cranial nerve lesion make the diagnosis very probable.
3. The intermittent character of the symptoms are of value in the arrival at a correct diagnosis.
4. A report of a typical case together with abstract of literature is presented.

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PARKINSONISM FOLLOWING CARBON MONOXID POISONING *

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The pathology of illuminating gas poisoning has been well described in the German literature. A bilateral pallidal necrosis usually develops in man as well as in experimental animals. In 1921, Ruge (1) reviewed the literature to date, and more recently Richter, (2) C. and O. Vogt, (3) Weimann, (4) Wohlwill, (5) Hiller, (6) and Pineas (7) have reported cases, in all of which symmetric pallidal softening was present when life was prolonged for some days.

When detailed microscopic examination was undertaken miliary hemorrhages, softened areas, or thrombosis of the smaller vessels were found in other parts of the central nervous system. A. Jakob (8) described a case with bilateral pallidal degeneration, diffuse cortical purpura of one entire hemisphere, and a large red softening of the white matter. Hyaline thrombi in several vessels and an old syphilitic endarteritis were present which Jakob thought prepared an optimum condition for the action of the carbon monoxid. Weimann reported a case with old cerebral syphilis which revealed multiple, diffuse, ring-shaped hemorrhages.

Softening areas in the cortex have been described by Mueller, Pfeiffer, and Sibelius, (9) and in the cerebellum by Herzog. (10) Hiller recently reported a case of carbon monoxid poisoning with death fifteen days later in which, added to bilateral pallidal softening, there were necrotic areas in the zona reticularis of the substantia nigra, diffuse hemorrhages in the pia and the cerebral white matter, and incomplete thrombosis of the pial veins. There were softened areas in the deeper cortical cell layers and marked generalized vascular dilatation.

The following case has special interest because life was prolonged for two months after the poisoning, certain psychic symptoms developed which have been recently attributed to the basal ganglia, and parkinsonism was present.

* From the Laboratory of Neuropathology, Friedrichsberg, Hamburg (Prof. A. Jakob, Director).

REPORT OF CASE

Clinical History: A woman, aged fifty-eight, after a year of gastric symptoms, had undergone a laparotomy in the spring, 1924, at which an inoperable carcinoma of the stomach was found. The patient then became depressed, but was physically in fair health. October 18, 1924, she was found unconscious in a gas filled room. She regained consciousness after a few hours in the hospital, where she had daily emesis, but was apparently psychically normal and revealed no motor disturbances until November 13, 1924. Orienta-

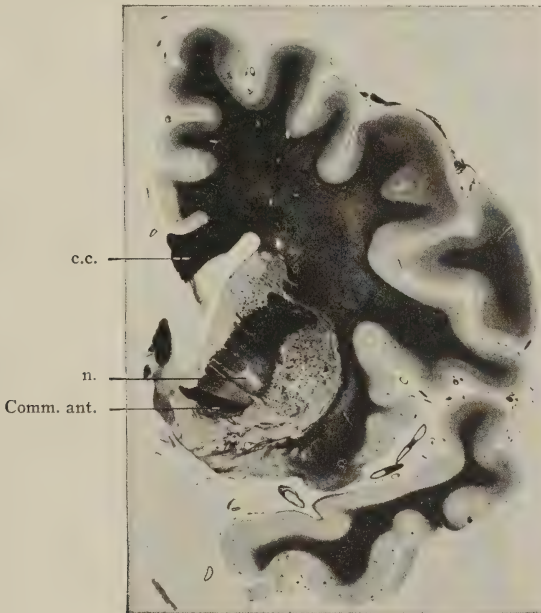


FIG. 1. Showing the beginning of the necrotic area of the right pallidum (n.) and the flecks of demyelination in the deep white matter.

tion then gradually became poor, she became completely apathetic, and did not speak. She acted queerly, putting her belongings in a sputum cup and expectorating continually about the ward.

The patient was transferred to the state hospital for mental diseases, where it was found that the pupils reacted to light and in accommodation, the reflexes were equal and normal, and the plantar response was flexion. She lay motionless and rigid, with a mask-like face. The palpebral fissures were widely opened and winking was infrequent. The left nasolabial fold was deeper than the right.

There was no paralysis. Muscle tonus was greatly increased in the arms, especially the left, and the legs were slightly stiff. Spontaneous movements were not made. The patient presented catatonic symptoms, the arms remaining for a long period in positions passively given them, the legs returning slowly to a position of rest. On standing she fell backward and the gait was small-stepped without arm swinging. The patient answered questions only after long pauses and seemed to have great difficulty. Speech was slow and monotonous, and she finally became mute. The rigor increased markedly, especially in the left arm. December 21, 1924, death occurred with pulmonary edema, two months after the carbon monoxid poisoning.

PATHOLOGIC FINDINGS (BRAIN ONLY)

Grossly, in coronal sections, symmetrical, yellow brown, necrotic areas were seen in the pallida. They extended from the anterior tip to the center of the ganglia. Dorsally they reached to the dorsal border of the pallida and lay against the internal capsule. The lesion on the right side was larger and extended further in all directions. The caudal portions of the ganglia were normal. The macroscopic appearance of the remainder of the brain was normal.

MICROSCOPIC EXAMINATION

Weigert stained, large coronal sections (Fig. 1) revealed necrotic areas entirely devoid of myelin at the anterior ends of the pallidum on both sides. Caudally these areas increased rapidly in size and extended to the internal capsule (Figs. 2 and 3). At the level of the posterior end of the anterior commissure the necrotic area on the left side was small and limited to the dorsal portion of the pallidum, but the entire pallidum and ansa lenticularis were poor in myelin. On the right side the necrotic area was larger. On both sides the lesions ended at the middle portion of the ganglia. Caudally, save for a few light flecks of demyelination, both pallida were normal.

The striatum revealed a slight demyelination of its finer fibers but was free from definite lesions. The ansa lenticularis, subthalamic body, and capsule of the red nucleus were thinned. The lateral pontine bundle from the pallidum to substantia nigra was partially degenerated.

In the deep layers of the white matter, especially the centrum semi ovale, from the frontal to the occipital poles, were revealed irregular light fleck-like markings (Figs. 1, 2, 4 fl.), which under

a high power were seen to be areas of partial demyelination. The internal capsule and corpus callosum were normal.

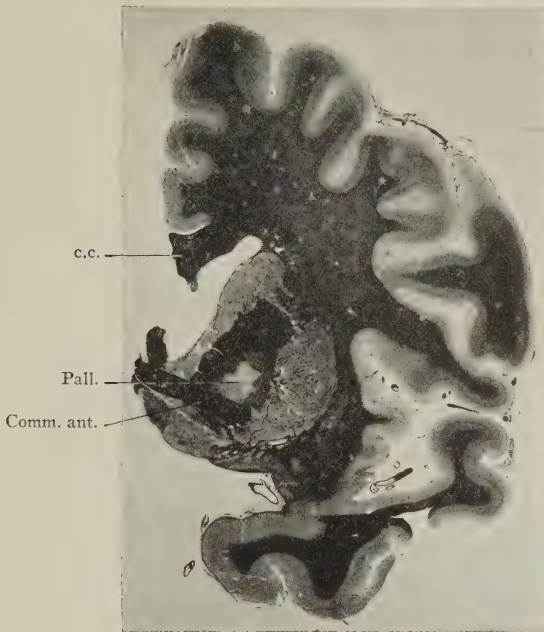


FIG. 2. Further caudally revealing the entire pallidal area (pall.) necrotic on the right side.

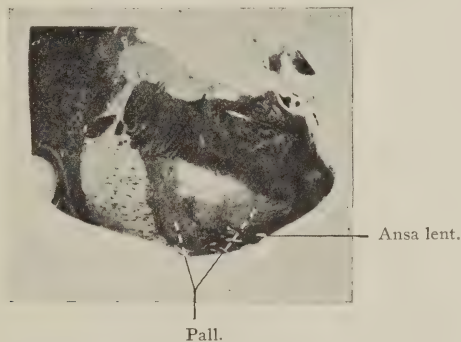


FIG. 3. The left pallidum showing the smaller area of necrosis.

Elective stains revealed the necrotic pallidal areas to be surrounded by numerous free, rounded gitter-cells filled with lipoid material. There was a moderate vascular proliferation but no increase of connective or glial tissue. There was no attempt at scar formation.

The anterior regions of the pallida were severely affected (Fig. 5). The blood vessels (*g*) were markedly dilated and had a moderate lymphocytic accumulation about them. In the media of the arterioles were light blue, glistening droplets which stained dark blue with hematoxylin, the so-called "pseudocalcium." The ganglion cells were shrunken and stained darkly with toluidin blue. The nuclei were shrunken and the protoplasm was diffusely stained. There was a marked increase of the glia cells of all forms: the large protoplasmic glia; the small, cytoplasm-poor cells (the oligodendroglia of Hortega), and the long, slender stäbchen cells or microglia. The

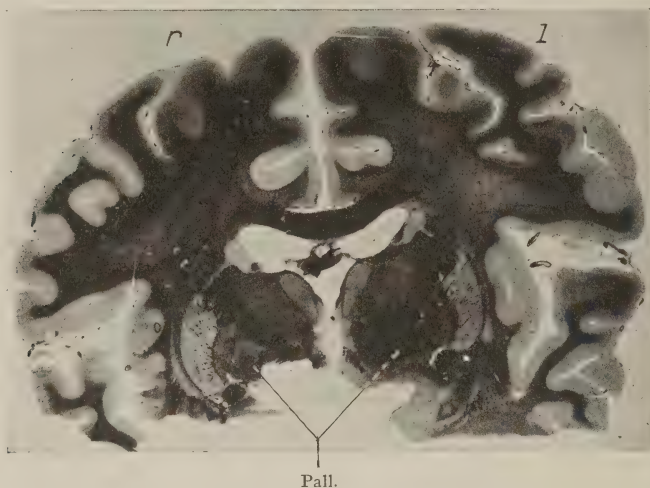


FIG. 4. Weigert section at the level of the oral end of the mamillary body showing the changes in the white matter and the areas of demyelination of the right pallidum.

dark color and nuclear irregularity revealed a progressive irritation of the glia.

In the remaining portion of the ganglia were several small, circumscribed island-like areas with ganglion cell degeneration and increase of glia cells. These areas were perivascular, about dilated vessels whose lining endothelium contained lipid material.

The pial and cortical vessels were dilated and showed fatty changes in the endothelium. Slight fibrous adventitial proliferation revealed a moderate arteriosclerosis. The cortical layers revealed no change other than the increase in lipid content of the cells, corresponding to the age of the patient. The subcortical white matter was normal.

The deep white matter in Herxheimer preparations contained many lipid filled glia cells in numerous small collections (Fig. 6) coalescing to form diffuse patches. These glia cells were of the fixed type and were not free, rounded gitter-cells. There were no perivascular collections of gitter-cells. With Nissl stain the glia cells had definite signs of a progressive change. The protoplasmic glia cells were increased with darkly staining nuclei and swollen

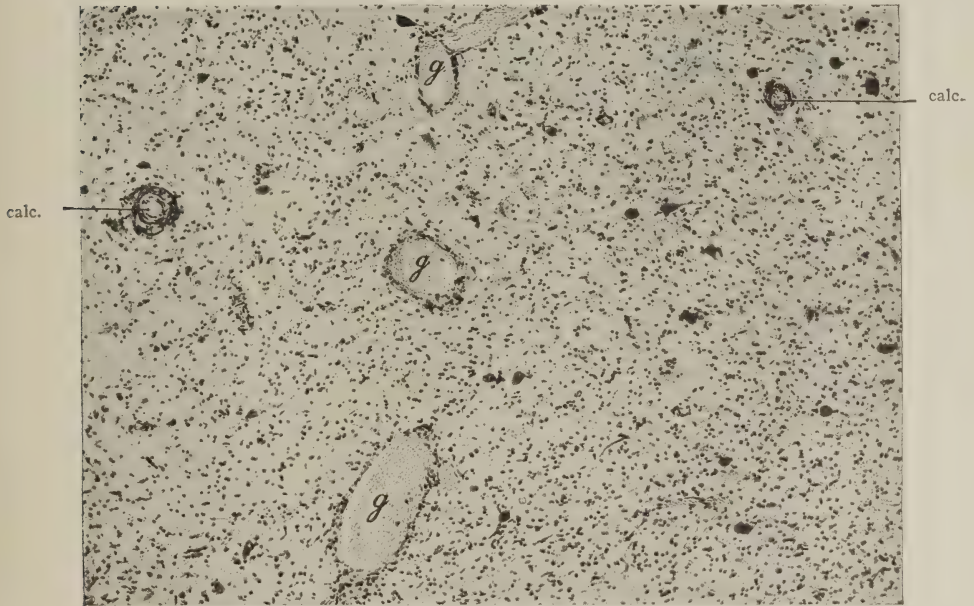


FIG. 5. Toluidin blue stain of pallidum from the same area as Fig. 4, showing markedly dilated vessels with slight lymphocytic infiltration and pseudocalcium deposit in the media (calc.).

vacuolated cytoplasm. The oligodendroglia cells were proliferated and had an enlarged net-like cytoplasm. Microglia cells were also present. The picture is that of a diffuse parenchymatous lesion, without softening or vascular reaction. In Jakob-Mallory stained sections (Fig. 7) there were many normally myelinated fibers running through the patches, but also many fibers undergoing subacute degeneration, surrounded by vacuolated myelophages and all three types of glia cells. Scattered in the diffusely affected tissue were small areas in which all the nerve fibers were degenerated. The glia groundwork was swollen and stained diffusely. Bielschowsky (Figs.



FIG. 6. Herxheimer stain showing the distribution of the fat bearing glia in relation to the blood vessels. Dilated vessels (g).

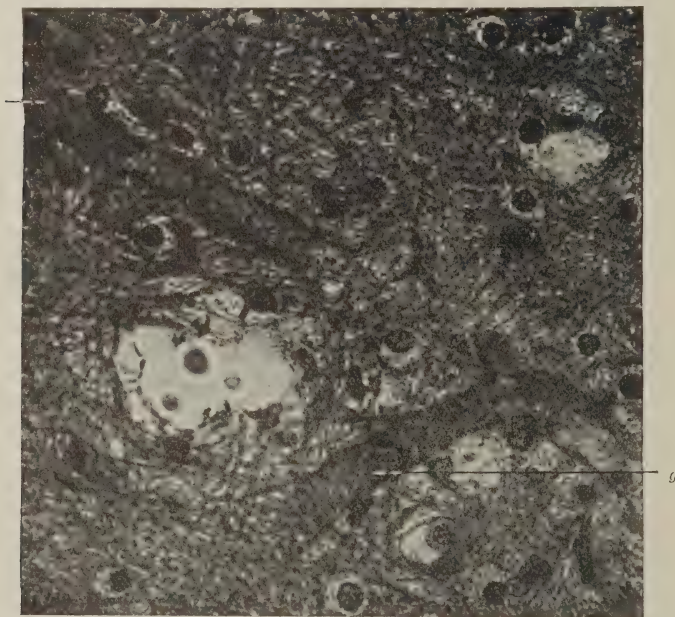


FIG. 7. Section of the white matter revealing the small areas of complete destruction of the axons and sheaths and numerous protoplasmic glia cells. Jakob-Mallory stain. Showing also the relation of the areas to a blood vessel (g).

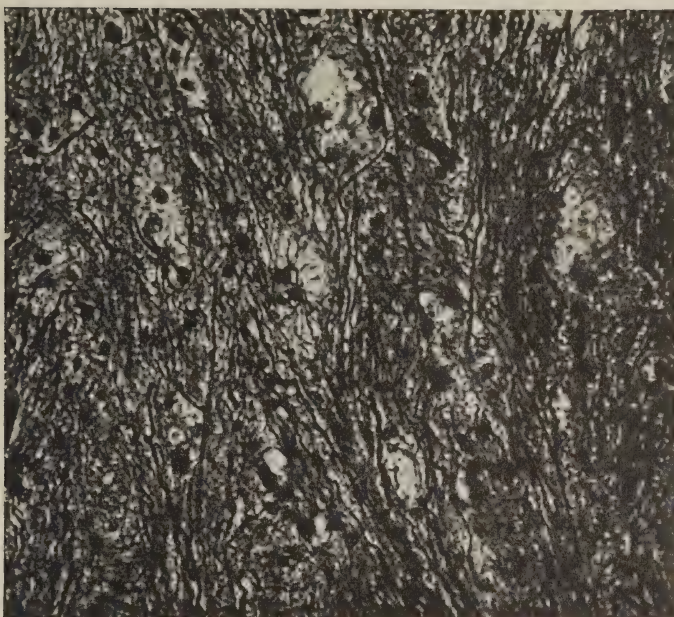


FIG. 8. The white matter showing the relative preservation of the axis cylinders though these are swollen and in places broken up. The lighter areas represent lipoid material. Bielschowsky stain.



FIG. 9. Marked swelling and fragmentation of the axons; the groundwork is stained diffusely. Bielschowsky stain.

8, 9) sections revealed an axis cylinder destruction in the small areas, but the myelin loss was far more extensive than that of the axons. The remaining fibers were swollen and had irregular indentations. The glia reticulum had a brown washed-out appearance, was somewhat porous, and fine vacuoles were also present. The degenerated areas appeared to have no constant definite relationship to the blood vessels.

COMMENT

The pathogenesis of the central nervous system lesions following carbon monoxid poisoning is difficult of explanation. Why is the pallidum so typically attacked, especially at its anterior end? Kolisko (11, 12) contends that a predisposing vascular disease is usually present and that the blood supply of the anterior pallidum is relatively poor, coming from the anterior cerebral arteries through long branches which bend backward at a sharp angle to pierce the anterior perforated spaces. Jakob finds no parallel between the necrosis and previous vascular disease; he has seen cases with normal vessels.

C. and O. Vogt (13) discuss the predilection of diseases for certain parts of the nervous system which they have termed *pathoklisis*. They give as the foremost example the effect of carbon monoxid on the pallidum, believing that a specific chemicophysical organization of the tissue explains the regularly appearing pallidal necrosis.

Against this conception is Haggard's (14) report on the growth of neuroblasts of chickens *in vitro* in a 70 per cent medium of carbon monoxid. He believes that the gas acts not as a toxin on nervous tissue but by asphyxiation of the tissue, by shutting off the oxygen supply, since carbon monoxid has 200 times as great the affinity for hemoglobin that oxygen has. Furthermore, chronic carbon monoxid poisoning in mine workers causes no permanent nerve lesion. If the structure of the pallidum had a certain affinity for carbon monoxid it might be expected that the entire ganglion would be destroyed instead merely of one portion, and chronic poisoning (15, 16) should also cause a pallidal lesion.

Hiller believes that carbon monoxid is a vascular poison causing vasodilation, which is usually found, and stasis, with resulting nutritional disturbances in the tissues.

In my case, vasodilation and vascular degeneration in the pallidal vessels, the pseudocalcium, were found. I believe the fact that carbon monoxid causes anoxemia and vascular paralysis renders the anterior pallidum with its capillary net of end arteries, which have

coursed backward with a sharp bend, most susceptible to destruction. The lesions in the deep myelin layer may be explained on a similar basis as the blood supply is from the basal vessels, end arteries which have a meager capillary network.

The lesion in the deep layer of white matter is an extraordinary and interesting finding. The process involves mainly the nerve fibers causing a demyelination and to a far less extent an axonal destruction which is most marked in minute circumscribed areas. The lesion is, however, really diffuse, as evidenced by the changes in the glial groundwork. There is no actual softening. It is difficult to label the process but the "myelinopathy" of the Germans best describes the changes in this case. This myelinopathy resembles that observed in the group of diffuse sclerosis, or Schilder's disease,(17) which are degenerative and of unclear etiology. The striking resemblance between the pathology of diffuse sclerosis and that of this case of carbon monoxid asphyxia renders it not unlikely that Schilder's infantile disease has an etiologic basis in asphyxia, perhaps occurring during birth.

The patient's rigidity and akinesia can, in the light of the work of C. and O. Vogt, Jakob, and L. H. Lewy, undoubtedly be attributed to the bilateral pallidal necrosis. These authors have described cases of chorea, athetosis, and rigidity which were clinically limited to the upper or lower limbs; pathologically, the lesions were limited to the corresponding half of the opposite basal ganglia. They believe that this means a definite somatotopic basal ganglion localization.

In my case, I believe we have an excellent example of pallidal localization. The upper portion of the body was very rigid, and the anterior portions of the pallida were necrotic. The left side revealed more rigidity than the right, and the right necrotic area was by far the larger. It is justifiable to conclude, therefore, that whatever be the rôle of the pallidum in the production of rigidity, pathologic evidence points to its anterior end as being in relation to the contralateral upper portion of the body, and its posterior end to the lower limb.

In the case reported there was no tremor or hyperkinesia; but pure rigidity. This agrees with Vogt's theory that tremor is due to striatal (caudate and putamen) lesions and rigidity to pallidal lesions. The striatum was absolutely normal. However, the Vogts also believed that partial pallidal lesions result in athetosis. Certainly, hyperkinetic movements were not observed in my case although the lesion was definitely partial.

The psychic state of early wildness and disorientation with mutism

later must be attributed to the lesions of the white matter. Many intracortical association fibers were undoubtedly destroyed. A point of interest here is that Kleist (18) and Pineas (19) have lately described a new clinical entity, psychomotor apraxia, which they associate with basal ganglion lesions. They have attempted to relate the motor and psychic symptoms in gross striopallidal lesions, for example in carbon monoxid poisoning, without detailed examination of the remainder of the brain. It is easily seen to what great error this may lead, for even so severe a lesion as I have described could not be determined macroscopically.

CONCLUSIONS

1. An unusual degenerative change in the cerebral white matter following carbon monoxid poisoning is described and is best termed myelinopathy.

2. The pathogenesis of carbon monoxid poisoning is probably an initial vascular paralysis followed by asphyxia of structures having a relatively poor capillary supply.

3. There is a definite somatotopic organization of the globus pallidum.

4. "Psychomotor apraxia" is due to a diffuse cerebral lesion and is not of pallidal origin.

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POSTENCEPHALITIC RESPIRATORY DISORDERS
REVIEW OF THE SYNDROMY, CASE REPORTS AND DISCUSSION

BY SMITH ELY JELLIFFE, M.D., PH.D.

OF NEW YORK

(Continued from page 611)

PART II

REPORT OF TWO CASES AS PARADIGMTA

Case IX

This particular case is of considerable interest not only because he made a complete recovery during psychoanalytic therapy (see Witzel's cases), but also because he has been under observation for nearly a year and was reported by Burr, C. B., who had him under treatment. Hence any personal ideas of how sick he was or was not can be further interpreted in the light of Burr's report.

I therefore give Burr's description first and append my own later. Certain small inaccuracies in Burr's description are questioned (?).

Case 1.⁵ History. [Compare this with report later appearing.] This case shows the influence of soil, the kind of protoplasm one is born with, in determining the results of acquired disease. If the youth had had a different heredity, he would have presented a different clinical picture, because different protoplasms react differently to the same stimuli. Had the physicians who examined him before he came under my care learned the family history before making their diagnoses, there would not have been such great differences in their opinions. Forming their opinions on a mere cross section of his life, his condition on one day, one diagnosed hysteria, another dementia precox, a third high grade imbecility and the fourth petit mal.

He came of highly intelligent but uneducated German-Russian Jewish stock. His mother was very neurotic, indeed hysterical, and his father was subject to outbursts of causeless anger, followed by periods of depression.(?) Neither parent knew how to train and guide a boy born, as this boy was, with abnormal tendencies.

The patient during childhood and early boyhood was bright but neurotic, and presented no marked abnormalities in conduct or behavior until he was seventeen years old, when he began to have a respiratory

⁵ Burr, Charles W. Sequelae of Epidemic Encephalitis Without Any Preceding Acute Illness (Chronic Encephalitis). Arch. Neur. & Psych., XIV, 1925, p. 20.

tic,(?) for which I could find no exciting cause. At first he had many attacks daily, of rapid, noisy expiration lasting a minute or two. Some months later, his nose was fractured, and the resulting obstruction increased the severity but not the frequency of the tic. The nose was operated on, and soon after he passed through an attack of scarlet fever. Several months later, the respiratory tic ceased. The cause of the cessation I do not know, but I am sure it was not the curative effect of the fever. He returned to high school when eighteen years old (January, 1923), but did not do well and soon began to have "drowsy spells." The teacher, two months after his return, notified his parents that he would either have to keep awake or leave the school. No one suspected illness; everyone, like the teacher, assumed laziness.

During the Easter vacation, almost three months after somnolence began, he suddenly became acutely ill with sore throat, vomiting and fever, and two days after the onset delirium appeared. At the end of a week, he seemed to be well, and returned to school, which he attended until the end of the school year, but he did not do well. The periods of sleepiness continued, and he failed in his examinations. [This encephalitis attack was one year earlier and preceded the tics. J.]

He was brought to me when nineteen years old because of personality changes. His parents stated that from the time the tic began they had noticed alterations in his conduct, which they thought indicated viciousness. Previous to its appearance he had been a bright, happy, ambitious and industrious schoolboy. He grew lazy, surly, had outbursts of causeless anger and became disrespectful toward his parents. They verified the history of attacks of sleepiness, and rapid breathing and were positive that the acute febrile attack, mentioned above, occurred months after the other symptoms.

Examination.—The most striking thing in his appearance was the facial rigidity. He had the facies of paralysis agitans. The skin was oily over the entire body, and he had facial acne. During my first examination he had an attack of hysterical rapid breathing. Neither attitude, excluding the face, nor gait suggested paralysis agitans, but at times he showed local catalepsy. If I put either arm in any position, he would hold it so for an indefinite period, and then it would slowly drop to the side. He was pleasant in manner toward me (this changed later) but was somewhat childish, making me suspect the beginning of an adolescent dementia.

Treatment and Course.—I sent him to the Infirmary for Nervous Diseases for observation. While there, his mental symptoms became marked. He had periods of surliness, was childish in manner and took interest in nothing. He had no periods of drowsiness; on the contrary, he slept poorly. He had several attacks as follows: he would hold his breath, become blue in the face, stand with eyes wide open staring into space, extend the arms and fingers stiffly, remain rigid and speechless for about half a minute, then relax and become normal. He was not

unconscious during the attacks, and they were manifestly hysterical. I sent him away under the care of a skilled companion, but he rapidly became more demented and unmanageable. He would refuse to get out of bed, several times attacked the nurse in fits of causeless anger, talked impertinently to strangers, and would make suggestive and even obscene remarks to passing women. He continued to have attacks of rapid breathing and to show local catalepsy at times. Throughout the whole period of my care of him he realized that there was something wrong mentally with him, except at certain short periods when he became dull and stupid, not somnolent, if left alone, but angry, abusive, profane and obscene if ordered to do anything. When I last saw him, six months after my first examination, the symptoms of paralysis agitans had increased, his facial muscles were more rigid, there was a fine tremor of both hands, and he had begun to stoop at the shoulders.

My final conclusion was that the paralysis agitans syndrome was the result of epidemic encephalitis, but that the dementia would have appeared sooner or later in any event, indeed had already existed before. [Italics, S. E. J.]

CASE HISTORY X⁶

It concerns a young Jewish boy born November 20, 1904. His father was born in Russia, his mother in Hungary, they were not related so far as known. Both are alive and well and all collaterals are free from diabetes,⁷ goiter, alcoholism, tuberculosis, epilepsy, or any now known nervous or mental disease. [They are high strung but their protoplasm is as good probably as anyone else's protoplasm in spite of Burr's just quoted statement.] There were five children born. A brother nine years older—then a boy who died in infancy of whooping cough, then a sister four years older, the patient, now twenty, and a sister, twelve years younger. These remaining children are, so far as known, relatively healthy. The sister married about a year ago.

The patient was born without difficulty, walked and talked at the usual age, was bright and of average capacity, read at five to six, had measles only, did not wet his bed, bite his finger nails, stammer nor stutter, walk in his sleep or have other ascertainable infantile compulsive habits.

He was an impulsive, happy go lucky kind of a boy, fond of joking and joshing, was very sociable, easy to get acquainted with, fond of music, sang popular songs with much pleasure, aspired to play an instrument, but as his older brother banged the piano when he wanted to sing he never conquered the technical difficulties. He was at the average grade in high school. At twelve or probably earlier he was taught masturbation—see later the rôle played by "Jerry" by whom this genital organization period of his sexuality was influenced.

⁶ As given by Jelliffe. Somatic Pathology and Psychopathology at the Encephalitis Crossroad. A Fragment. Journ. Nerv. & Ment. Dis., LXI, 1925, 561.

⁷ Grandmother on father's side had diabetes late in life.

The forerunners are slightly perplexing. There are slight indications of difficulties in school at about fifteen to sixteen; he liked to play hookey with the "boys" and they went to "shows." Then something acute occurred:

Description of Delirium: Account by Brother

"X. had been a student at S. Preparatory School. It was near the Easter vacation when he came home. It was either the last week in March or the first in April, 1922. [Dr. Burr has it incorrectly as 1923.] He had complained of having had a slight sore throat and an influenzal condition for two or three days. The school doctor gave him the usual treatments for such ailments and thought it best to send him home for a day or two.

He came home in the early afternoon. He was running a slight temperature and was quiet and seemed depressed. We put him to bed and sent for our family physician, Dr. L. He diagnosed the condition as an influenzal sore throat, prescribing an alkaline gargle and giving a cough compound containing minute doses of codeine.

X. slept alone. He seemed quiet as far as we could tell during the night.

In the morning, along about 9 or 10 o'clock when I went into his room, he said, "Get out and let me alone. Let me rest. I had an awful night."

We left him alone. He got out of bed in the afternoon and started to wash and shave. It was apparent that something had happened to him. He acted as though he were laboring under some tremendous excitement.

When I went to talk to him in the bathroom, he was singing and shouting and laughing. "Wow," he shouted, "I like my liquor strong and my women weak." He sang and shouted and yelled while completing his toilet. His eyes were bright and his gestures and gesticulations spastic and exaggerated and jerky.

His teeth chattered and he shook all over like a jelly at times. I stood with him until he quieted down, for say ten or fifteen minutes. This acute stage of his delirium did not last more than half an hour, as far as I can recollect.

When he quieted down, he said to me, "I can't tell you what happened to me last night except that it was something terrible. I suffered all night. I dreamt that I died and then came to life again and saw angels. [There are a few more details in this dream delirium which are of psychoanalytic interest but of no importance here. Thus the "angels" he saw were two carved angel figures which were in the back of an old couch, no longer in family's possession but once used by mother while nursing this boy. He has no conscious recollection of ever having seen them. The settee was disposed of when he was about seven! (?)] I think my heart stopped beating for a while. [Compare with many

similar anxiety attacks in Encephalitis.] It was just as if I died and came back to life. Mark what I tell you. This is going to change my whole life. I'll never be the same again after what happened to me last night."

He was jumpy and nervous all day long, his teeth chattering at intervals. Toward nightfall he seemed to become his usual self again.

I was alarmed by this exhibition and at first it occurred to me that he might have been suffering from an overdose of the codeine which was in the cough medicine. I find that this was present in the mixture only in tiny dosage, not enough to have caused the disturbance.

Of course, we all worried about his behavior. But he apparently returned to normalcy the next day and went back to S. It was not for two or three months that he began sniffing through his nose, complaining of some obstruction in his nostril that interfered with free breathing. This sniffing and a talkativeness which manifested itself particularly at night were the first sequel to his night delirium.

The sniffing increased that summer. It frequently kept us up at night. I slept in his room at that time. He would talk and talk and ask me a multitude of questions at bedtime. His questions were coherent to be sure, but they became extremely annoying and finally I'd have to tell him to "shut up" in order to get him to bed.

Along about August 1st, the sniffing became so persistent that he was taken to a nose and throat man who said he found a definite obstruction in the right nostril. Arrangements had been made to have this removed when the automobile accident came along on August 28, 1922, and interfered.

In August, 1922, while being driven in an automobile the car skidded into a telegraph pole and the patient's nose was injured. This caused more sniffing and more efforts to remove the obstruction.

A Dr. A. had treated the nose at the time, and later, June 19, 1923, brought him to see F. X. Dercum, to whose courtesy I am indebted for the following history:

"I saw X. upon one occasion only. He was brought to my office on June 19, 1923, by Dr. A. of Mt. Holly. The patient's age was given as eighteen. Dr. A. stated that he had met with an accident in the latter part of August, 1922, which resulted in a bad injury to his nose. She stated that she personally had treated the injury, had raised the bridge of the nose and had dressed it carefully. Subsequently the boy saw Dr. L. There was some obstruction so that he could not breathe properly."

"Dr. A. described 'spells' from which the patient suffered. She stated that he would 'sniffle' at night, would go to the bathroom and in order that the family should not hear his sniffing, he would turn on the water in the basin; that at times he was very uncomfortable and on some nights unable to sleep; that at times he breathed like a patient suffering from asthma. If his attention was diverted, the attacks usually ceased. She

stated that at other times he would occasionally get into a condition as though 'suffering from tetany'; that his hands 'would get clenched.'*

"The physical examination by myself yielded little of moment. The gait and station were normal. There was no tremor, the tongue was protruded in the median line and not tremulous. The lips were protruded firmly. The angles of the mouth were retracted equally well. The pupils were of average size, well rounded, equal, reacted very promptly to light and to accommodation and convergence. The tendon reflexes were normal. There were no sensory losses. There were no functional nervous symptoms present at the time of my examination; the mental examination also was negative. Laboratory findings reported negative.

"After making some suggestions to Dr. A. as to the boy's method of living, general hygienic care, further observation, etc., she left me with the understanding that he was to be placed under treatment, as far as the nose was concerned, by Dr. L."

History by Burr.—On December 6, 1923, another specialist [this was Dr. Burr referred to, compare with history here—B.] was consulted who has kindly sent me the following history:

"In August, 1922, patient was in an auto accident, suffered a fractured nose but was not unconscious. He entered the J. Hospital for a nose operation for obstructed breathing. Prior to accident he had a tendency to a habit spasm of forcibly expiring air through his nose. While in J. he contracted scarlet fever and was sent to a Municipal Hospital. He had a light attack and in six weeks returned for the nose operation. Following the nasal operation he went to a business college one month, was still continuing the habit of forcing air through the nose. In January he again returned to high school. But it seems he did not succeed well; the patient states he had drowsy spells, would try to concentrate, then fall asleep. The teacher remarked that he would have to remain awake, or he could not stay in the class. He did finish the year of school but failed in two subjects. He states he worried constantly over the obstruction in his nose; he lacked interest in his work."

"In March, 1923 (this should be 1922), Easter vacation, he had an attack of sore throat, grippe, and a severe stomach upset. In about forty-eight hours this was followed by a semidelirious spell with fever; states he had a terrible dream in which he was dying and saw angels. The next day he was very much excited, seemed afraid and continually screamed, 'I will never be the same again.' He seemed to be normal the next day and returned to school, but the patient states he continued to feel sleepy in school.

July 1 (1923), a tonsillectomy was performed; immediately following this, the patient began to have spells of deep breathing through his mouth.† These spells usually come on in the daytime, and occur after excitement, they are simply attacks of deep rapid breathing that last about five minutes, then the hands will straighten out and be stiff and uncomfortable. At the

* Thus Dercum's notes show he had the "spells" before 1923 as reported by Burr.

† See previous note of Dercum's re "spells."

same time the muscles of the face stiffen. At one time his feet have stiffened with the attack. The patient states that at this time, and the mother confirms the statement, that he had salivation "drooled at the mouth." His brother often remarked that he foamed at the mouth and the mother would ask him to use his handkerchief for this. He still has this trouble, but not as bad as before. Since July he states, "he feels lazy all the time—lacks pep," he adds: he has felt this way since the scarlet fever. He feels drowsy all day long, but cannot sleep. The early part of the night he is awake, then falls asleep about 2 A.M. During the month of August, he was at a boy's camp, and felt some better there, but the breathing continued."

"In October (1922), he had another nasal operation, obstructed right nostril. States his breathing is worse since then. The patient states he is irritable and the mother confirms this, she states he seems to greet strangers warmly now, whereas before he never did. She thinks there has been a decided change in his personality."

"*Physical Examination—General:* The patient is a robust boy of about twenty years, pleasant and agreeable, seems overly agreeable, his reaction does not seem perfectly normal; he has a tendency to be child-like in his behavior, but this is not marked. There is a noticeable fixity of the facial expression, and his face is unduly oily with slight acneform eruption present. There is no noticeable body stiffness, nor are his movements slowed, there is something suggestive, however, in the way he seems to maintain one position for long periods, such as holding his hands and arms semiflexed.

"Eyes: Half staring. Reaction normal, extraocular movements normal. Fundi: Retina appears slightly congested, with disk margins slightly hyperemic, although this may be normal.

"Cranial nerves: Loss of facial expression, otherwise normal. No seventh nerve weakness of either side.

"Mouth: Tongue slightly coated. Teeth O. K. Tonsils removed.

"Chest-heart sounds normal. B. P. 120/75. No murmurs.

"Lungs: Clear and resonant throughout.

"Abdomen: No masses or rigidity, reflexes all present.

"Extremities: Upper, very slight tremor of outstretched hands, power O. K. No rigidity, reflexes are overactive on both sides.

"Lower: Outside of unusually prompt and equal achilles and patellar jerks, neurologic examination is negative. No Babinski.

"Station and gait: Nothing abnormal noted."

History in Dr. B.'s private office records:

"*Examination December 6, 1923:* Patient is a well nourished, rather well muscled youth of nineteen years. In appearance he does not look like the average Jewish boy, but rather of Irish descent. He gets in and out of bed easily. There is no awkwardness or any abnormality in gait, station, posture, or in use of any extremity or set of muscles, with the exception of his facial expression which is rather set and 'waxy' to a slight degree. Speech is normal. Extraocular movements normal. There is no diplopia, nor is there any history of it. Tongue is clean, shows no tremor. Palate moves well. Teeth in good condition. Thyroid is not enlarged. Pupils are equal, regular in outline, normal in size and react

promptly to light and in accommodation. Vision is good in both eyes. Hearing, equilibration and taste are normal. No motor ataxia in arms. No sensory disturbances anywhere in the body. Knee jerks, Achilles jerks, biceps and triceps jerks, abdominal, cremasteric and plantar responses are equal and normal. Heart action is regular. No murmurs are audible. Rate at rest is 80 with an increase to 118 after effort. Area and position is normal. Blood pressure 118/80. Lungs and abdomen grossly normal.

"Blood Wassermann—negative. Blood count—4,470,000 red cells, 14,200 white cells, 86 per cent hemoglobin. Differential count of white normal.

"Urine—several examinations show nothing abnormal. Some mucous threads.

"He left the Orthopedic Hospital on December 24, 1923. His condition became worse. He would talk to strange people on the street; had periods of sullen anger; struck his nurse several times; and masturbated frequently.

"Though there is no positive history of epidemic encephalitis I believe that he had it, and that it is very largely the cause of his present condition. I also believe that there is more degeneracy in the case than I have been informed of, and that that has causal bearing."

He was under Dr. B's treatment for several months. Dr. B. saw him every month or six weeks during which time he was sent on a farm. He had a male nurse with him. Here he was no better. The patient states that he had a miserable time on the farm. He slept most of the time on a big sofa and was unable to do any of the help on the farm expected of him. This took us to June, 1924. His respiratory attacks he states were frequent, sometimes 15 or more a day, he had polydipsia and polyuria and was miserable.

Then he had another nurse—a "religious fanatic," the patient called him. His behavior, especially during the trance states that followed his breathing attacks, was quite psychotic; he was obscene, swore and created scenes. These so frightened the nurse that commitment to an institution was suggested. Then the treatment under Dr. B. was terminated and the patient went to reside with a physician. This was unsatisfactory. Then he went to a "boys' camp." Here he had a hard time, he states.

I first saw him the latter part of October, 1924, and here purpose dealing only with certain features of the situation.

The neurological status at this time contained a number of findings not before emphasized. The chief ones are a well marked parkinsonian attitude and progression. For the first three weeks in November, 1924, the patient walked like a dummy with arms half bent and held outward. There is distinct weakness on the right side.

of the body. A fine tremor, at times both sided, but more marked on the right side; again a hemitremor, right. The right palpebral fissure is slightly larger than the left and the left pupil is larger than the right. He has a distinct Horner's syndrome, to be discussed at some other time. Details on the CO_2 , pH, and calcium content of the blood, showed only slight variation from the presently accepted ranges. The other neurological features practically coincide with Burr's statement.

Without burdening this report with further detailed anamnesis, it may be summarized that this patient developed a mild but distinct post-encephalitic syndrome following the delirium of March, 1922,



FIGURE 1. *Beginning of attack—Puffing 3 minutes, 60 to minute*

augmented after tonsillectomy (ether), the most outstanding features of which are:

- (1) Paroxysmal respiratory episodes, nasal and buccal tics, with trance states, salivation, and occasional tetanoid cramps.
- (2) Parkinsonian attitude with slight tremor, more marked on right side.
- (3) Character anomalies, most marked when he was on the farm.

(4) Mild "greasy face."

(5) Polydipsia and polyuria.

Brief discussion will be here offered upon the respiratory attacks. The seborrhea will be discussed in a separate paper; also the Parkinsonism, the polydipsia and polyuria, and the tremors.

1. *The Respiratory Attack.* The precise steps in its evolution are not altogether clear. Some weeks after the delirium sniffing was noted, and the idea of nasal obstruction became obsessive after the auto accident, these increased and some mouth and nose grimaces began; the full blown respiratory attack is stated by the brother to



FIGURE 2. Next 2-3 minutes—facial movements—hands getting stiffer

have begun probably after the tonsillar operation.⁸ They have been constant now for at least two years, although they have begun to improve greatly during the past two months.

These respiratory attacks vary in frequency, in duration, and in severity, following, in general, the type I of Marie and Lévy.⁹

⁸ I have notes on a number of these respiratory attacks taking place after tonsillectomy and psychoanalytically raise a question as to whether the operation is in some way related to a castration phantasy.

⁹ Marie, P., and Lévy, G. See thesis of Lévy, G., and her monograph, *Les Manifestations Tardives de l'Encéphalite Epidémique*, Doin, Paris, 1925, p. 137 et seq.

Since I have seen him, a daily record has been requested, and the patient usually says 3 to 4 attacks, sometimes 2 or 3, sometimes, "oh! a lot of them." At times he has them off and on all day long. On a trip to Montreal with his brother the respiratory difficulty persisted twenty-four hours and the cramps (tetany) were very painful in both hands and feet and face. On one occasion only—February 24, 1925—he telephoned me that he had gone all day without an attack.

They seem to start for no ascertainable reason, but certain "complex indicators" have been ascertained. He says that smoking will start them, but observation shows that he seeks a cigarette rather as an effort at mitigating or side-tracking an attack. In other words,



FIGURE 3. Hands in rigid position 5-7 minutes

the psychical component would utilize both a cigarette and an attack as an outlet for the unconscious displacement.

The attack may be diverted or arrested. There is no certain technique that can guarantee this, but enough has been learned about the unconscious vent to predicate along what lines one could at times supply surrogate outlets for that which lies beneath the attack. Inasmuch as different attacks represent different level discharges of preconscious and unconscious material no adequate diversion technique is likely to master all of this wish material.

Eating as with case Y is accompanied by increase rather than by decrease of the respiratory difficulty.

A mild attack (high level) discharge will be finished in four to five minutes, the breathing will not be over thirty to forty to the minute, and there will be no trance state following.

In a severer attack the puffing becomes deeper and more rapid, the patient becomes definitely anxious, the contortions of the nose, wide dilatation of the nares, protrusion of the lips, etc., increasing



FIGURE 4. Ten minutes—trance state, which lasted 2-3 minutes—whole attack about 10 minutes

fixation of the body, fixed rigid mouth movements, puffing or blowing takes place, the respirations go up to seventy to the minute, the pulse to 100, the hands begin to become cyanotic, and the patient is "feeling rotten," as he may be able to tell you—then the breathing gets more superficial and a definite cessation of breathing occurs (see tracing). The parkinsonian rigidity becomes more pronounced; he used to shiver a great deal at this stage, and he has a definite hypo-

thermia—96° F.—more marked on the left than the right side; the eyes look off, the pupils dilate somewhat, the face becomes mask-like; the palpebral fissure narrows, the mouth purses up, saliva commences to drivel from the mouth, and in from ten to twenty minutes after three, four, and five minutes of this trance—in which he states his mind is a blank—in which he only “wonders if he will ever get well”—he comes to, smiles, says he has “snapped out of it” and is all right again. When he was on the farm and being “treated” by his nurse, he was frequently obscene and almost violent in these trance and semitrance states, which at times would persist half an hour [hence the “degeneracy” designated by B.].

More than half of his attacks are “trance” free—and there is a record in earlier attacks of a partial loss of consciousness and the necessity for lying down in certain of these trance states. He has never fallen in one of them, but almost “goes out,” he says. [These are probably the petit mal attacks to which Dr. Burr refers as diagnosed by other physicians.]

“Trance” attacks have been recorded without any recognizable antecedent breathing attacks. These were more common during his stay at camp and while on the farm—especially at times when he had a loathing for his male nurse.

In the earlier periods the breathing attacks were accompanied by tetany-like stiffness in his jaw, his hands, left > right, and occasionally painful cramps in the feet.

One severe attack lasting thirty-five minutes took place during an interview in my office, and was accompanied by what he described as “Jesusly painful” cramps. The hands were not in a typical obstetrical position as in tetany, but were more semigrasping in their nature. He would and could not take hold of something. He had atypical Chvostek reactions, electrical hyperexcitability, but no Trousseau in the intervals.

These cramp states have been greatly ameliorated during the past two months. Only two or three have occurred since I have seen him, whereas as he recollects they were two or more times daily in occurrence and he dreaded them—crying violently from their painful and anxiety producing qualities.

His own memory is somewhat unreliable about these attacks.

Polydipsia and polyuria are accompaniments of this whole situation. At times this has been so great he would go to the toilet fifteen to twenty times a day, drinking large quantities of water.

In the milder trance states one can obtain his attention; he may smile at a joke, answer retardedly in monosyllables, but in others

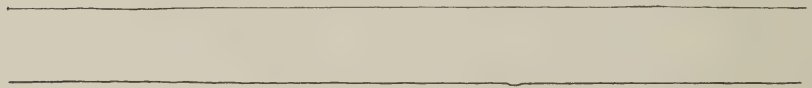
Began at 4:26 P.M., Sunday, March 22, 1925.



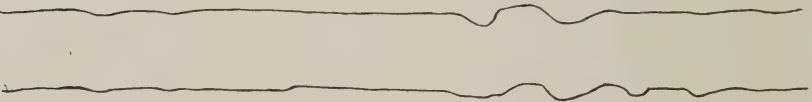
1. Period of rapid breathing—7 minutes.



2. Beginning of apneic phase—3 minutes.



3. Apneic phase—3 minutes.



4. End of apneic phase, resumption of normal breathing.

Ended at 4:40 P.M., Sunday, March 22, 1925.

First line: Intercoastal Breathing.

Second line: Diaphragmatic Breathing.

Third line: Time markings at rate of 72 per minute.

there is no response, although he can repeat phrases, etc., spoken during this period, showing that he is not unconscious. In one or two attacks I have demonstrated a partial hazy consciousness without retention of what was said—quite analogous to certain “hypnoleptic”-“pyknoleptic”-epileptic trance states to which they are undoubtedly definite homologues, differing but little in the unconscious content or even dynamic.

One pneumographic tracing was taken by Dr. Yale Nathanson of the University of Pennsylvania, and I append his notes, as illustrative of a comparatively average severe attack:

“Am forwarding herewith pneumographic record made yesterday, March 22, 1925, of X. The record was begun at 4:26 P.M. and continued until 4:40 P.M. The red line shows intercostal breathing with the pneumograph and body band placed above the nipples; the blue line shows diaphragmatic excursion and the time interval as shown in the bottom line is regulated to 72 per minute. The apparatus used was the Marey tambour with the double edge pneumograph and connecting tubes.

“May I say, before explaining any of the record, that I trust you will appreciate the fact that I am not attempting any interpretation of the record, and where it so seems it is due entirely, let me assure you, to my eagerness to supply you with what information I was able to glean from watching X. while taking the record.

“To begin with, while I was preparing the apparatus, he seemed more than interested and told me that he felt he was going to have one of his typical tetanic spells. By the time I placed the pneumographs in position he was breathing quite rapidly, as shown at point ‘A,’ probably close to 50 or 60 per minute, and talking facetiously, making remarks about the apparatus, the room, etc., just as I have observed in him during these (several) months. He kept apologizing for making these remarks, and assuring him that it was perfectly all right, he continued his rapid breathing as shown by the record. At point ‘B’ he lessened his conversation but the breathing continued. At point ‘C’ he assumed a posture of tetany-like rigidity and reached for his pocket for a handkerchief which he held at his mouth for some time. He then maintained this position of absolute quiet, paying no attention to me or the apparatus, standing perfectly quiet and gazing into the far corner of the room, which is a blank wall. During this time, as the record shows, there is practically no breathing and a definite suspension of all activity, a slight cyanosis, about lips and chest. The only movement detectable is a slight twitching of the skin of the chest. He was very cold throughout this part of the procedure, although the room was not uncomfortable. As indicated on the record, he started talking to me and complained of feeling ‘groggy.’ I tried to engage him in conversation and he discussed the fights which he had seen the night before. His breathing began then and as he requested it I gave him a cigarette.

"After a minute or two he said: 'Well, I'm out of it now. Can you tell it by the record?' At this time his pulse was 96. I had forgotten to take it at any other time, but if you wish it I shall be glad to take a plethysmographic record whenever you say.

"It was quite interesting to me, the long spells of suspended breathing coming, as they do, with the peculiar lapse of attention. They look, indeed, like fatigue reactions following upon the rapid breathing and its attendant exhaustion. The lack of respiration should certainly find a high correlation with lack of oxygenation and general metabolism."

This practically completes the description of the respiratory attacks, towards which group of phenomena this study is specially directed.

I wish only to add one note to this in reference to the therapy which will be discussed later. Psychoanalysis by the regular Freudian method was carried on for a period of approximately 6-7 months, during which the attacks ceased completely and have remained absent now for over a year. [July, 1926.]

It is not without interest that an arranged meeting in my office with case Y in April, 1926, when he had been free from breathing attacks nearly a year, produced a very marked emotional disturbance. He almost broke down as he was talking with case Y—expressing his great sympathy and was about to begin a breathing attack when he straightened up and said to himself, "snap out of it," smiled and was himself again.

(To be continued)

SOCIETY PROCEEDINGS

NEW YORK NEUROLOGICAL SOCIETY

THE FOUR HUNDRED AND TWENTY-EIGHTH REGULAR MEETING,
APRIL 6, 1926, THE PRESIDENT, DR. I. ABRAHAMSON, PRESIDING

THREE CASES OF INTRAVENTRICULAR HEMORRHAGE (LANTERN SLIDES)

DR. IRVING J. SANDS

(Author's abstract)

The first case was that of a man of thirty-two, of excellent family and personal history. He was well until one month prior to his admission to the hospital. At that time he suddenly fainted while at work. He went home and returned to work on the following day, complaining for a week of headache and nausea. Two weeks later he fell unconscious, and was in a hospital for a week. He then complained of dizziness and headache. One week ago he again became unconscious and was taken to the hospital, where he showed definite bloody spinal fluid, rigidity of the neck, slight Kernig and diminished reflexes. After twelve hours he regained consciousness, and complained of headache spreading from the base to the vertex of the head. The symptoms gradually disappeared. He was recommended for discharge, the diagnosis being subarachnoid hemorrhage due to rupture of a small intracranial aneurysm. He suddenly lost consciousness, had peculiar adductor and abductor movements of his left extremity, and died. At autopsy, there was found a sacculated aneurysm of the left posterior communicating vessel of the Circle of Willis, which had ruptured in two places, the last time into the left inferior horn of the lateral ventricle, and flooded the ventricular system. No other pathology was found elsewhere in the body.

Case II was that of a middle-aged man who for some six months prior to his illness had complained of dizziness and headaches. He discontinued work two months ago. He suddenly collapsed while at dinner, frothed at the mouth, and became unconscious. He was taken to the hospital where he showed definite cervical rigidity, fixed pupils, trismus of the jaw muscles, and bloody spinal fluid. He died within one hour of admission to the hospital. He showed marked basilar cerebral arteriosclerosis, with hemorrhage into the pons, and into the fourth ventricle and the cisterna magna. He also showed chronic nephritis, general arteriosclerosis, and emphysema.

The last case was that of a school superintendent near sixty, who became unconscious while at work and was immediately brought to

the hospital. He was observed by us for eighteen hours and a diagnosis of intraventricular hemorrhage was made on the cervical rigidity and generalized spasticity, the diminished deep reflexes, and the persistent bloody spinal fluid. He showed an intraventricular hemorrhage; the insulting vessel could not be located despite careful examination of the entire cerebral vascular system. He also showed cardiorenal vascular disease of the sclerotic type.

Discussion: Dr. E. D. Friedman said: Have you any idea concerning the etiology in the first patient? There was neither hypertension nor evidence of infective endocarditis, producing a secondary mycotic aneurysm of the brain. Did the patient show any evidence of status lymphaticus?

Dr. Sands replied: No; there was no evidence of status lymphaticus; he had no other pathology in the body. About a third of the cases described do not show any reason to explain why the disease occurs. The other aneurysm that I presented a year ago did not have any. This case illustrated an interesting point: the first blood count was 24,000 leucocytes. This high count is almost pathognomonic of cerebral hemorrhage in the acute stage. Four days later it fell to 14,000. In the case that had the marked arteriosclerosis I could not find any cerebral aneurysm.

ADDRESS BY DR. ARTUR SCHUELLER, OF VIENNA, AUSTRIA (By invitation)

(Abstract)

Lantern slides of X-ray pictures were demonstrated of cases presenting defects in the skull of an unusual type called "pituitary dysostosis."

The first case was seen in 1914, a girl five years old, who presented a left sided exophthalmos. She began to drink six or eight liters of water a day. This was followed by exophthalmos of the right eye, and then the defects in the skull became evident. They were sharply outlined. At the base the floor of the sella and the upper part of the sphenoid body are destroyed. The top of the orbit shows in the plates a large defect so that a mechanical exophthalmos is produced. The brain presses on the eyeball and pushes it forward. The case was again seen in 1919, at which time the defects had absolutely closed. Diabetes insipidus was present. The child had no symptoms of brain lesion; the intelligence was good.

The second case of this kind was published by Christian (Boston). His case was also a child of five years with diabetes insipidus, exophthalmos and a large defect in the skull. I presume that this symptom complex (diabetes insipidus, large defects in the skull, and exophthalmos) is due to a hypophyseal disturbance. Christian thinks, too, it is an unusual type of hypopituitarism.

One similar case published in Germany showed on autopsy atrophy of the pituitary gland; there were no cells in it at all; it was considered a case of pluriglandular insufficiency.

There was an Italian case of a man twenty-three years old; his

symptoms began at thirteen with exophthalmos and diabetes. The man did not grow from his thirteenth year, and showed multiple defects in the skull, so that we have again the combination of diabetes insipidus, exophthalmos, and defects of the skull, together with dwarfism.

The next case was seen by me a few months ago. The child had diabetes insipidus, exophthalmos and large defects in the skull consequent to infectious disease. The lower jaw was absolutely gone. The case later showed the defects are disappearing. This also was a case of dwarfism.

The next pictures showed no defects in the skull, but a large area of osteoporosis. One case had very intense headache and was operated on by Dr. Cushing.

The remaining pictures were of skull defects presented for differential diagnosis. The first was of a child twelve years old with a defect of the vertex, with no symptoms of lues or tuberculosis. Following X-ray treatment the defect disappeared in a few weeks.

The second case was that of a boy fifteen years old showing defects in the parietal and temporal regions. He had an angioma of the skin; it was supposed that these defects of the skull were due to angiomas of the skull.

The third case showed a defect of the skull due to tuberculosis. The next was due to carcinomatous invasion of the bone of the skull, starting in the scalp. The next, a case which metastasized from a sarcoma of the testis; the next, a case of osteoperiostitis luetica; the next, one of multiple gummata of the skull; this woman was supposed to be a hysterical patient, but she showed multiple gumma, and after iodine treatment the defects were healed. The following case illustrated a localized gumma. The next is one of myeloma of the skull with many small rounded defects; the following is one of metastases of a thyroid carcinoma to the skull.

"Pituitary dysostosis" seems to be largely an American disease; there are in the literature other cases described in America, by Hand, in 1903, and by Kay, in 1905. It was not supposed that these cases were cases of pituitary disturbance of glandular secretion. Hand supposed his was a case of tuberculosis, and the other one was thought to be hydrocephalus. Grohs and Stifel (Toledo) in 1923 described a case; and in the last months, one was reported from Omaha, Nebraska. Apparently this pituitary disease is not as unusual as is supposed, and it seems to be more common in America than in Europe.

Discussion: Dr. Leopold Jaches (by invitation) said: I have seen only one such case, a few years ago. I believe it will be published by Dr. Denzer whose patient it was. There were large defects all over the skull, and the child had diabetes insipidus.

Dr. Moses Keschner asked: Did the other bones show any other changes?

Dr. Schueller replied: The defects were mostly in the skull; but they were also found in the femur and in the pelvis.

Dr. Keschner said: Did the terminal phalanges show any evi-

dence of the lesions observed in some of the other diseases of the pituitary gland?

Dr. Schueller replied: No.

Dr. Walter M. Kraus said: I have been very much interested in Dr. Schueller's paper, particularly in the relation of the bony changes in the skull which he has described, to those which occur in the pituitary gland. The relation of the pituitary gland to the central beginnings of the visceral nervous system in the region of the tuber cinereum about the third ventricle has also been of great interest to me.

About ten years ago I presented a case of a Paltauf dwarf to this Society. In this case trophic disorder was an established fact in that the patient, though thirty-seven years old, was extremely small. The control of the water metabolism was conspicuously impaired, in that this patient developed what I called a diabetes insipidus which ended in a complete anuria prior to his death and following severe edema. Such transient edema was reported by Paltauf in his original description of this type of dwarf.

In addition to these findings the patient at autopsy showed almost complete destruction of the pituitary gland. The relation of the pituitary gland to the central beginnings of the visceral nervous system was not clear to me at that time. Since then the significance of this relation has been very much emphasized in many parts of the world, and Greving has recently shown that there exists a tract from the periventricular nuclei directly to the pituitary gland. Consequently, when considering the relation of the various signs and symptoms which are attributed either to the pituitary gland or adjacent nervous centers, one must bear in mind that the origin of such signs and symptoms, including the skull changes which Dr. Schueller has so admirably demonstrated, may be only nervous and not pituitary in origin.

Dr. B. Kramer (by invitation) said: Were there any changes indicative of the presence of late rickets? Were any blood studies made to see if there was a change in the condition of the blood-forming elements, and was any particular treatment effective in correcting this condition?

Dr. Schueller said: In reply to Dr. Kraus, I suppose when we say "pituitary disease" we mean disease of the pituitary gland and the base of the third ventricle. It would be better to speak of the "pituitary system."

In reply to Dr. Kramer, the cases never had symptoms of rickets. The bones were normal in shape, size, and structure. Examination of the blood was made by Christian especially, and in the case published from Omaha. No disturbance in the blood was marked. No treatment was successful. We do not know why in one case the process progresses and in the other the condition is cured. Diabetes insipidus can be influenced by treatment, by the injection of pituitrin. One of my cases had a good result from X-ray treatment and iodine. The second case showed improvement after measles, so that after measles the defect began to be closed. It would be interesting to find

out the primary cause of the disease. I suppose there can be different primary processes, either infectious processes invading the pituitary system or tuberculosis. The importance is only in the localization of the process.

Dr. Isador Abrahamson said: I would like to relate a case which presented many similar symptoms. The child was operated on for adenoids. The mother stated the child bled very much after the operation, and there was a lot of adenoid tissue removed. I saw the child about four weeks later with multiple malignant tumors over the body. What was operated on originally was probably a nasopharyngeal malignant tumor; the child developed bilateral exophthalmos; and had large masses throughout the skull, and one in the spinal column giving rise to a transverse myelitis; but the skull picture and the bulging eyes that Dr. Schueller described were present—probably a lymphosarcomatosis throughout the body.

Do the children get over the exophthalmos or do they lose their eyesight? Is Dr. Schueller familiar with the further clinical histories of the patients?

Dr. Schueller replied: Some of the cases died, so that it is not possible to say anything about the course. The child in whom the defects were closed showed a persistent exophthalmos, and the other symptoms, diabetes insipidus and dwarfism, did not disappear. There are only eleven cases on record, and therefore one cannot say what the course of the disease will be, but the defects disappeared in many of the cases.

Dr. Abrahamson said: There is a clinical syndrome called *dysostose cleido-cranienne*.

Dr. Schueller replied: We have seen these, because Scheuthauer of Vienna was the first to describe it. We have three specimens in Vienna. I did not show these cases because they are different. The defect is always in the median line corresponding to the region of the large fontanelle, and the shadow of the skull is characteristic. It is broad and flat. It is a familiar disease. We saw two clinical cases, and they had no other symptoms. They had no diabetes insipidus.

FAMILIAL CALCIFYING CEREBRAL DEGENERATION (LANTERN SLIDES)

DR. WILDER PENFIELD AND DR. H. RAWLE GEYELIN (By invitation)

(Authors' Abstract)

Dr. Geyelin said: The case presented is a male child of ten, who since his fourth day of life has suffered from three different types of epileptic manifestations. The chronological order of their appearance is as follows: (1) Left facial spasm accompanied by bilateral pupillary contractions, occurring only when he ate, followed in two months by (2) generalized epileptiform convulsions which have diminished greatly in frequency during the past year; prior to that they were of daily occurrence. (3) At the age of nine began to have Jacksonian type of seizure involving right hand with face turned to left followed by a brief period of mental excitation.

The family history reveals the mother to be in good health. There was temporary insanity at birth of last child. The father has had migraine headaches most of his adult life, but none since the occurrence one and a half years ago of three isolated major epileptiform seizures. Lower grade mentality. X-ray of skull shows calcified areas in brain. The oldest child, fifteen years old, shows essentially the same condition as the patient. The second child, a male, died at the age of four with the same condition as that of the patient. Autopsy revealed multiple calcified tumors and an abnormally heavy brain. The third child, a male, is the present patient. X-ray shows calcified area in the brain. The fourth child, female, aged eight, has similar convulsions to those of patient which began when she was six months old. She also shows calcified areas in the brain similar to those of the father and older sister.

All the children show marked mental deterioration.

The general physical examination of the patient was essentially negative. The blood and spinal fluid Wassermann tests were negative.

The general neurological examination shows no clinical localizing signs.

The values for the blood and spinal fluid calcium are within the normal range. The calcium excretion in the urine and feces over a fifteen day period was within normal limits.

The basal metabolism was normal.

The routine blood and urine examinations were negative.

Stereoscopic films of the skull show a dense, irregular shadow in the right posterior parietal region which seems to be parallel with the inner table, but which projects into the cranial cavity. It appears as though the calcium deposits were within the brain substance rather than in the meninges. The mass is approximately the size of a pigeon's egg.

Dr. Wilder Penfield continued: When the boy (the operative case to be shown to-night) came into the hospital, he had palsy of the left sixth cranial nerve; the left pupil was larger than the right. The optic discs showed a moderate amount of primary atrophy; otherwise the physical examination was negative. The mental condition was, of course, very unsatisfactory. While in the hospital his mental condition became steadily worse, so that when asked to put out his tongue, he only opened his mouth or did nothing. X-rays of the skull showed in the occipital lobe on the right side a calcified area which is more or less discrete. There is evidence in the plates that it is either hollow or that there are two furrows. There is calcification also in the region of the pineal gland. We thought it might be a calcified pineal gland pushed across to the opposite side of the expansion of the lesion in the occipital lobe.

After obtaining the history that the older brother had died with multiple calcified tumors, we had plates taken of the rest of the family. Plates of the mother's skull showed nothing abnormal. The father's skull presented three calcified areas in the brain and some smaller ones near the surface. These shadows are either umbilicated

or hollow. Plates of the sister Eva showed three calcified areas in the cerebral hemispheres which were also evidently hollow. For these plates we are indebted to Dr. Weeks, Superintendent of the Village for Epileptics at Skillman, New Jersey. The sister, Elise, eight years old, showed many scattered calcified areas throughout her brain, with definite furrows or hollows in them. These were all placed at a distance from the base, none were in the brain stem. They were all at the maximal distance from the circle of Willis; none appeared in the cerebellum and in general these are the characteristics shown by the roentgenograms of the other three cases.

In regard to the operative case: we were unwilling to operate at first, realizing the condition was a congenital one. However, we had the autopsy diagnosis from the hospital in Elizabeth, New Jersey, that the oldest brother had had multiple calcified tumors. This patient under consideration was the only one who showed calcifications localized to one point in the brain and the calcified pineal gland was apparently pushed to the opposite side. His general condition was extremely unsatisfactory. Therefore we considered we might possibly be dealing with a calcified tumor which was cystic. We did not give a hopeful prognosis. At operation we turned down a bone flap over the right occipital lobe. The dura was normal in appearance. On turning back the dura there was an area corresponding to the large discrete nodule seen by X-ray which was quite avascular. There were almost no vessels on the surface of the brain here. The tissue was hard on palpation and one could feel the sulci as resistant and rubbery. Anteriorly the brain appeared normal. Posteriorly it was normal except for two areas where there was a little induration. Inasmuch as there seemed to be a line of cleavage between brain and the indurated areas we resected the whole occipital lobe with the tumor mass in it.

Pathologically the case was of extreme interest. In the gross there was an egg-shaped mass measuring $8 \times 4 \times 3$ cm. The cortex toward the midline from it was a pink coral in color. It was definitely rubbery and resistant. In cutting through the mass the knife met with a resistance, which felt like soft sandstone. In the gross one could see a calcified zone which encircles a fissure of the brain, placed at the junction of the white and grey matter and running up into the grey matter a little distance. In the cortex posteriorly there was little except small hemorrhages which undoubtedly occurred at the operative removal of the specimen. It may be significant that the location of these small hemorrhages corresponds in a general way to the situation of the calcium zone more anteriorly.

In the brain at a distance from the calcified areas one sees the corpora amylacea which occur not infrequently in older patients in the substance of the brain. They were located mostly in the vicinity of the vessels.

The zone of calcification is made up of rather loosely arranged fibrous neuroglia cells among which are small granules of calcium. The vessels show the most striking changes. The capillaries are in many instances converted into tubes of calcium. The small arteries

and veins are also calcified. Most frequently the calcium is laid down in the media; it is sometimes in the adventitia also and then there is great thickening of the media, so that it may close the vessels entirely. Some of the capillaries are closed. At a little distance from the calcified area in the substance of the brain here, is a very marked glial reaction. It is patchy and frequently arranged around vessels and makes one think that the reaction in the brain itself is secondary to closing of the vessel. Elsewhere giant neuroglia cells are seen, some of which are frankly undergoing degeneration and dendrophagocytosis. From a histological point of view the evidence is in favor, not of the parenchymatous change of the brain, but of a primary change in the vessels, particularly the evidence of the neuroglia changes points in that direction.

The patient whom you see showed after operation a complete left hemianopsia; he has a left sixth palsy which is not always present and a paresis of the right facial nerve which shows in voluntary but not in emotional activity. Otherwise physical examination is negative. The month after he went home, his mother says, was the best month of his life; he improved mentally very rapidly and had no more convulsions. To be frank, it was a much more favorable result immediately after operation than we often get with the removal of a brain tumor, but of course I am not urging this treatment for the condition. During the last month or so, he has again had a return of the convulsions, although less intense. He still is very much better mentally than he was.

Physical examination of the little girl is negative; she has a left sixth palsy which appears for one or two days and disappears.

From the histological point of view we have evidence of a primary change in the vessels of the brain which is situated at the juncture of the superficial pial vascularization with the deeper vascularizations. It is in the deeper layers of the grey matter and extending down to the white matter. It is thus located for the most part near the endarteries and in one sense might be called an obliterative endarteritis. We have seen from the X-rays of the other cases that the calcifications are in the cortex of the brain, not at the base, but at a considerable distance from the circle of Willis and often at least situated about fissures in a manner similar to that shown above.

Without going into the literature fully at present, there are two chief types of calcification. Rokitsansky has shown that calcification of the brain may occur; the nerve cells may be calcified; and the arteries may be calcified, particularly in the white matter. Virchow pointed out a condition which he called metastatic calcification which occurred as the result of acute destruction of bone, anywhere in the body, as from tuberculous caries or osteomalacia, and it has been shown experimentally that the injection of calcium will produce these calcium deposits. It is deposited in certain points of election, that is, in the stomach, the lungs and the kidneys particularly. Wells pointed out that these are the organs which are probably most alkaline as they are secreting or giving up acid and it is possible that a decrease in carbon dioxide in the blood is a cause for calcium to be deposited in these areas.

We are justified in this group of cases in concluding that the deposit is not due to an increased amount of calcium in the blood, as X-ray showed no calcification in the thorax or abdomen where the sites of election are located. Everywhere in the body degeneration or necrosis will, in time, produce calcification. It seems that we are dealing here with a degeneration secondary to the obliteration of localized end-arteries, this degeneration becoming calcified. The condition certainly is familial, for it occurs in the father and four children. On a Mendelian basis, the process must be in the mother's family as well. It seems quite likely that it could be, because of the probable amount of inbreeding in a small town of the sort she came from. The husband came from a small town not far distant. The X-ray pictures seem to present a new type of appearance characterized by the laying down of calcium about the fissures of the surface of the cerebrum and it should be possible to diagnose this condition simply from the X-ray findings.

Just a word about the question of tumor. Although the boy who died was diagnosed as having calcified tumors, we had some doubt about it at the time, and I made every effort to get hold of the specimen. The hospital had moved; the pathologist had died; the technician who cut the sections had died, and the specimens were lost. We therefore only had the diagnosis written on the autopsy slip.

From the point of view of tuberous sclerosis there was no evidence of adenoma sebaceum, and there were no areas which suggest in any way glioma. There was a very marked gliosis, but in no sense glial cells which characterize new growth.

Discussion: Dr. B. Kramer (by invitation) said: About a year ago I saw a child who was brought to the dispensary for examination because of convulsions and fever, and all we could find were signs of cardiac hypertrophy. The child was admitted to the hospital and died in convulsions. Autopsy showed a tremendous heart and very extensive calcification of all the blood vessels, including the coronaries. I would like to ask whether there was any evidence of renal insufficiency in these cases, and were there any pathological changes in the kidneys of the fatal case.

We have been interested for some time in the problem of calcification, which may be divided into two parts. The first is, why does calcification occur at all; and secondly, why does it select certain places. We have been able from our studies on calcification in rickets and its failure to occur in ununited fractures to throw some light on why it occurs normally. We have shown that calcification will not occur unless the bone forming elements are in sufficient concentration in the blood. When they reach a certain minimal level calcification will not occur, and it will occur just as soon as the concentration reaches the proper level. As to why it should occur in certain places, and not in others, we have some evidence, but it does not solve the problem. One factor is the blood supply. It is very striking, as Dr. Penfield has shown, that calcification occurs in the zone just between pial blood supply and the vascularization from below. Calcification occurs in the provisional zone of calcification in cartilage in the zone between the blood vessel coming from the perichondrium

and going down to the juncture of the epiphysis and diaphysis, and those from the shaft that go up through the marrow spaces. It is in the zone between these terminal vessels that the calcification occurs. If you look at the calcification process as it occurs in the trabeculae of the bone, you will find that the blood vessels come in contact with the osteoid which lines the trabeculae, but the calcification occurs in the center of the trabeculae and works its way outward.

Dr. Ross Golden (by invitation) said: The diagnosis of tumors of the brain by X-ray depends usually upon the detection of, often, relatively slight changes in the bony structure. Calcification of brain tumors unfortunately occurs only rarely. When these films came up in the course of routine work, I assumed that we were dealing with one of these unusual calcified tumors. Dr. Penfield's operative findings came as a very interesting surprise, especially in connection with the subsequently obtained histories and skull films of the other members of the family.

The most important thing from the standpoint of X-ray diagnosis is to decide whether it is possible to distinguish these conditions from other calcifications which occur in the brain. A critical examination of the films discloses a number of facts, some of which have already been mentioned by Dr. Penfield, but which are worth emphasizing: (1) The distribution of the shadows throughout the hemispheres. They occurred bilaterally in every case. (2) The situation of the shadows a relatively short distance beneath the surface of the brain. (3) The multiplicity of the shadows. (4) Their character. Three types of shadows are present in these films: The first resembles the so-called "mulberry" shadow of calcified tuberculous nodes. If some of these were seen on a film of the abdomen or the neck, they would be interpreted as typical calcified tuberculous nodes. The second type is crescent or U-shaped. The third is ring-like or ovoid.

Bearing in mind the situation of the calcium deposits in the convolutions, as demonstrated by Dr. Penfield, it is quite obvious that the shadow will be ring-like, ovoid, or crescent shaped, depending upon the relation of the mass of calcium to the direction of the beam of rays. In every instance the density is irregular.

I have never seen just such shadows as these in any other condition and, in view of their correlation with the histological findings, believe that they can be considered as characteristic of this calcification of the brain. It is a most unusual condition and is certainly in marked contrast to the usual unfruitful examination of the skulls of epileptics by the roentgen-ray.

Dr. Schueller said: I am very much interested in these cases. I have seen a good many calcifications of the brain, but never anything like this. Two things are especially interesting: The first is the morphological appearance of the calcification, and the second is the familial history. The type of calcification is what we see in a scar. There are two types: one in a tumor and the second is in a scar. The most important point is that it is following the vessels of the brain. I think that the expression "tumor" should not be used. It is an old scar in the brain showing gliosis, thickening of the vessels,

and calcification mostly around the vessels. The question arises: what kind of disease is it? It consists of familial scars in the brain showing calcification. I am reminded of periarteritis nodosa. This disease is so unusual I would think it could be a case of familiar periarteritis nodosa.

Dr. Geyelin replied: In answer to Dr. Kramer's question, studies in renal function were made, and they were entirely normal. Rather complete calcium and phosphorus studies were made, not yet finished, but I am able to say that the calcium excretion in the stools and urine, over a fifteen day period, on a known calcium intake, showed no variation from the normal. The blood calcium and spinal fluid calcium before and after operation were within normal limits. The basal metabolism, done on two occasions, was in the normal zone; it was plus six and plus four. There was nothing abnormal in the blood or in anything else.

I think Professor Schueller's conception of the similarity to periarteritis nodosa is an extremely interesting suggestion.

As to the mentality of the father, he is able to earn a livelihood; I think he is slightly subnormal.

The points brought out by Dr. Penfield, both as to the microscopic character of these lesions, and the X-ray appearance, rather suggest that this is a unique condition. Whether it can be associated with any of the conditions spoken of to-night I do not know.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Dawson, J. W., and Struthers, J. W. GENERALIZED OSTEITIS FIBROSA.
[Edin. M. J., Oct., 1923.]

This extensive paper by Dawson and Struthers is really a monograph based on extended study in the research laboratory of the Royal College of Physicians of Edinburgh. An endeavor is made to describe the essential histologic features in a case of generalized osteitis fibrosa, and to indicate the conceptions underlying the pathologic process involved in bone dystrophies. The view put forward relates osteitis fibrosa to an initial disturbance of the controlling activity of the bone cell over its calcium metabolism—an activity which is partly regulated by a hormone from the parathyroid glands. The process of decalcification is thus reduced to a defective functioning of the bone cell, following damage by an agent circulating in the blood or deranged hormone [or vegetative—Ed.] control. The damage to the bone cell may be caused by any one of the factors outlined above, especially toxins resulting from faulty tissue metabolism, and those elaborated in the intestinal tract. The automatic regulation of the supply of hormones, or, in other words, the call of the damaged bone cell for an increased supply of hormone, leads to hyperactivity of the parathyroid gland—a hyperactivity which results in hyperplasia, and in a possible perversion of the hormone, for in spite of its hyperplasia, the protective regulation of the activity of the bone cell is insufficient. The individual bones affected may be related to factors inherent in the individual.

Phillips, Herman B., and Rosenheck, Charles. NEURO-ARTHROPATHIES:
A CONSIDERATION OF THE ETIOLOGY AND GENERAL CHARACTERISTICS.
[J. A. M. A., Jan. 5, Vol. LXXXIII.]

Neuroarthropathies caused by peripheral nerve disease or injury or other factors are not definitely understood and may occur with more frequency than is usually believed. These neuroarthropathies are possibly misinterpreted, on account of the absence of demonstrable disease of the central nervous system. In the wake of such misinterpretation, extensive joint operations may be performed unnecessarily, as in one case cited. The possibility of neuroarthropathy should always be considered in obscure or ill defined joint manifestations, even in the absence of cord

disease. The etiology may be found in disturbances of the peripheral neural apparatus or other hitherto unknown factors.

Horine, Emmet F. "HEART-BLOCK." [Kentucky Medical Journal, XXI, 559.]

Lesions of the conduction system of the heart are relatively frequent and their recognition is of great importance because such defects usually indicate extensive myocardial damage. The possible factors concerned in the production of heart block are numerous. The prognosis in each case depends entirely upon the exact diagnosis. Therefore a mere diagnosis of heart block is incomplete unless the exact causative factor can be determined. In studying the causes of heart block Horine suggests that they be discussed under two headings, namely: (1) Intrinsic cardiac; (2) extrinsic (vagal). The possible intrinsic cardiac causes of heart block are discussed under the following headings: (1) Toxic degeneration and edema; (2) interstitial myocarditis; (3) arteriosclerotic processes; (4) spread of disease from valvular involvement; (5) fatty degeneration; (6) syphilis; (7) tumor; (8) congenital defects.

The possibility of gummatous infiltration of the bundle should be thought of in every case of heart block of whatever grade. Where the block is manifestly not due either to an acute process or to vagal influences, a Wassermann test should be made. The extrinsic cause for heart block is the result of the inhibitory influences of the vagus. Stimulation of the vagus leads primarily to slowing of the heart but if continued a delay in conduction follows. Vagal influences are more marked in cases in which there is preëxisting block from some other cause. Vagal influences may be either central, direct or reflex.

The article is illustrated with six electrocardiograms but Horine also discusses the bedside findings. He calls attention to the fact that one may suspect some degree of block with a pulse rate of sixty or under. However, one should auscultate and determine the ventricular rate for it may happen that alternate premature contractions (extrasystoles) are present which are of insufficient strength to open the aortic cusps and thus produce a radial beat. In such a case the ventricular rate will be twice as great as the radial. He also mentions that one must differentiate between an occasional premature contraction and a dropped beat with partial heart block. With a ventricular rate of from thirty to forty complete block is probably present.

The treatment must of necessity be governed by the causative factor, In block which is the result of vagal stimulation atropin will, if given in sufficient doses, abolish all vagal influences. The smallest dose necessary for an adult is a fiftieth of a grain and it may be that even a twentieth by hypo will be required. In block due to intrinsic cardiac defects atropin is of no value.

He cautions against the institution of too drastic antisyphilitic treat-

ment in block due to involvement of the bundle by a gumma, either directly or by pressure. If intensive treatment be used causing rapid absorption of a gumma a defect will be left in the musculature which may result in aneurysmal dilatation or in actual rupture. For this reason mercury and the iodids should be used in preference to the arsenical preparations.

In partial block from any cause digitalis is ordinarily contraindicated because it will usually increase the existing block. It is for this reason that the promiscuous use of digitalis in every heart case is to be condemned. However, in complete block where auricular fibrillation coexists or where the myocardium shows evidence of weakening digitalis is of value and can be safely used.

Adrenalin acts upon the accelerator fibers of the sympathetic system to the heart and causes thereby an increased rate. Since adrenalin also seems to cause increased conductivity in the bundle of His it might be of value in small doses. Horine feels that oxygen could be of only limited value in heart block with the Stokes-Adams syndrome since ventricular slowing or standstill often precipitates these attacks. [Author's abstract.]

Nobécourt. RAYNAUD'S DISEASE AND ERYTHROMELALGIA. [Progrés Méd., March 15, 1924.]

Both of these syndromes are regarded as disturbances of the vegetative system. The first signifies a vasoconstrictor angiospasm, while the other is a vasomotor paralysis. The livid tint of the Raynaud syndrome is in striking contrast to the hyperemia of erythromelalgia. Tuberculosis, syphilis, nervous and endocrine disturbances are considered as primordial factors. An attempt at antisiphilitic treatment may often be valuable. Otherwise, warm hydrotherapy and electric treatment are indicated in Raynaud's disease. On the other hand, erythromelalgia requires vasomotor excitation by cold water procedures. Opothrapy and—in the case of symmetric gangrene—surgical intervention may be needed.

Bullowa, J. G. M. OBSERVATIONS OF THE OCULOCARDIAC REFLEX IN DIPHTHERIA. [Archives of Pediatrics, XL, 306.]

Paralysis of the heart occurring during convalescence from diphtheria is probably due to vagus stimulation. Ocular pressure is a simple method of stimulating the vagus experimentally, in order to determine the condition of the heart. A diminution in the number of beats by 15 or more is considered to be a positive reaction. However, it is not advisable to continue the experimental stimulation to this extent for fear of injury to the heart. The test was employed in a series of cases of diphtheria. Of 24 patients who had the disease in a severe form, 7 died; 6 of these gave a negative response to pressure indicating that the severity of the condition did not affect the ultimate outcome more markedly than did loss of vagus response. Only one of these patients had bradycardia. Of the entire number of severe cases 9 failed to react positively to

vagus stimulation. The occurrence of a negative oculocardiac response during convalescence is not necessarily of fatal prognosis, although it is a grave sign. It has frequently been found that the response is negative at first, during the intoxication, but becomes positive later. A positive response may also become negative. The types of response differed in these cases. In some, a very brief latent period was present, in others there was considerable delay. In one case the cardiac impulses became more forcible without any change in rate. In another case extrasystoles occurred when the stimulation ceased. The vagal stimulation produced auricular systoles continuing through the ventricular pause, and sometimes resulted in cessation of the heart beat. The most marked changes were noted in the case of slow hearts (about 50 beats per minute). Bullowa is convinced that death occurring in diphtheria is not due to cardiac vagus paralysis. The most constant constitutional symptom in diphtheria is a rapid pulse. The most common local symptom is vessel palsy after stimulation from reflective sympathetic effect. Vagus death is due to lack of opposition, *i.e.*, sympathetic palsy.

Loeb, Leo. EDEMA.

The aim of this monograph on edema may be expressed as an attempt to present as a concerted whole the factors which regulate the water and salt content and maintain the homoiohydria and homoiotonia of the organism and its constituent parts, and edema as due to a defect in one or another part of this mechanism. In particular it is shown that such a defect may lead to a reversal in the direction of the main currents of fluid within the body. Just as a multiplicity of physical and chemical factors are instrumental in maintaining this mechanism which regulates the distribution and movements of the body fluid, so a multiplicity of physical and chemical alterations may lead to the production of edema. [Author's abstract.]

Reitler, R. IMMUNITY AS A REFLEX. [Wiener klin. Woch., Vol. LXXIV, March 13. J. A. M. A.]

Reitler induced stasis in the ear of rabbits, and then injected cultures of the colon bacilli or bacilli of the mesenteric group. He cut off the ear within three seconds after the injection. Nevertheless, the animals produced antibodies. Cocainization did not change the result, but injection of ether into the ear prevented the antibody formation.

Vidal, V. CONTRIBUTION TO THE SURGERY OF THE SYMPATHETIC NERVOUS SYSTEM. [Policlin., XXXI, Sez. Chir., 113. Med. Sc.]

This article, after discussing the basis of the work of Brünig and Lériché, relates three cases in which the author performed removal of the adventitia of the femoral artery in Hunter's canal. The first was a case of recurring ulceration in successive amputation stumps in the foot and leg of a soldier who had had a shell wound of the spinal cord low down.

The immediate effect was excellent and contrasted very favorably with all the many other means that had been employed previously to secure healing. After four months, however, ulceration of precisely the same character began again. The second case was a perforating ulcer in an alcoholic who had probably had syphilis, though apparently no Wassermann test was employed. The ulcer which had existed for two years was healed in a fortnight after operation and remained healed five months later, but at that time a new ulcer had appeared on the other side of the foot. The third case was one of chronic ulcer of the heel in an alcoholic, with severe radiating pains. After the operation, the ulcer, of a year's duration, healed in sixteen days and the pains entirely disappeared. No later report is available. In this case there had been no period of rest in bed before that following the operation, and some part of the improvement may have been due to that. The author admits the poor support which his cases give to the operation, but thinks, since it is innocuous and sometimes very successful, it should be tried for the sake of discovering improvements in technique and in the selection of cases suitable.

Kümmell, H., Jr. EXPERIENCES WITH SYMPATHECTOMY. [Zent. f. Chir., Sept. 22, Vol. LXXXII. J. A. M. A.]

Kümmell has performed periarterial sympathectomy forty-four times in thirty-four, and resection of the cervical sympathetic ganglion, in eight cases. The operation was successful in many cases, and in no case proved harmful. Sympathectomy usually entailed a lowering of the blood pressure, a more feeble pulse and a drop in the skin temperature, which after a few hours or a few days were followed by the opposite conditions. The circulation in the capillaries seemed to improve, as was shown by microscopic examinations. Kümmell agrees with Brünig that hyperemia is one of the main factors in the favorable effect of sympathectomy in vasomotor disturbances in the extremities. But that other sympathetic functions take part in the results is shown by remission of pain and also by the remarkable fact that following unilateral sympathectomy an effect on the opposite side was observable in some cases. In trophic ulcer the results were especially satisfactory.

Wood, W. Q. PERIARTERIAL SYMPATHECTOMY. [Edin. Med. Jl. February, 1924, 94.]

This paper reviews the work of Leriche, who showed that when the tunica adventitia is stripped from an artery there follows a reaction associated with vasodilatation. He attributes this to the removal of the vasoconstrictor fibers which are conveyed in the outer trunk of the vessel. This procedure is frequently followed by very striking results: there is decided improvement in local nutrition, sores heal, pains disappear, atrophied muscles improve, and thickened skin becomes more pliable. It appears that it may bring about the healing of intractable ulcers and ward

off threatened gangrene; it also appears useful in cases of causalgia. The results are not yet uniform, but justify giving the procedure a thorough trial. The chief risk in the operation is tearing the vessel wall, which is likely to occur in sclerotic vessels; the author therefore describes a substitute method devised by Sampson Handley, who, after exposing the artery, injects rectified spirit at four points round the circumference of the vessel into the tunica adventitia. He considers this method superior to the original operation, since it is simpler to perform and produces the vasodilator effects at once without the vasoconstrictor stage that occurs in the other operation.

Knöppler, H. RAYNAUD'S SYMPTOM COMPLEX IN HEART DEFECT. [Ztbl. f. Herz- u. Gefäßskrh., 1923, Nos. 8-11.]

Knöppler presents the history of a man, a smith thirty-six years old, with noncompensated aortic insufficiency, in whom there was marked cyanosis of both ears and of the skin below the zygomatic arch. The general blocking did not account for this phenomenon. Other cases of this sort are brought forward from the literature.

Wiedhopf, O. PERIARTERIAL SYMPATHECTOMY AND FREEZING OF NERVES UPON PERIPHERAL VESSELS. [Beitr. z. klin. Chir., CXXX, 399-445. Med. Sc.]

The author shows, by a series of plethysmographic observations upon the hind foot of dogs, that periarterial sympathectomy produces no change in the foot volume. Moreover, the usual reaction to a painful stimulus applied to some other part, *i.e.*, a decrease in volume (vasoconstriction) is equally well seen after such operative procedure. This latter can be abolished by freezing the sciatic nerve, a procedure which in itself gives rise to an increase in limb volume (vasodilatation). In the human subject, if the median and ulnar nerves are paralyzed with novocain, the volume of the hand increases, the skin temperature of the anesthetized area is raised, and the vasoconstrictor reaction to a painful stimulus is lost. The author concludes that both vasoconstrictor and vasodilator fibers to the peripheral vessels course in the trunk nerves. The presence of vasodilator fibers in the trunk nerve is however not proven. For the vasodilator effect seen upon freezing the nerve may well result from paralysis of the vasoconstrictor fibers. No evidence could be obtained of vasomotor nerves coursing to the peripheral vessels in the sympathetic network of the arterial wall. [Good bibliography.]

2. ENDOCRINOPATHIES.

Wetzel, A. ACTION OF THE POTASSIUM ION UPON SPASMOPHILIA. [Zschr. f. Kinderhkl., Vol. XXXII, Nos. 1, 2.]

The author could not determine an increase of excitability through the K-ion after feeding with K salts in spasmophilic or in nonspasmophilic

children. On the other hand, in febrile infections there were evident manifestations of spasmophilia. Also in nonspasmophilic children under certain circumstances mechanical and galvanic overstimulability could be demonstrated, *e.g.*, in febrile illnesses, perhaps also in close weather. There was no evidence that the K salts tended to fermentation so far as the stools could show.

Bergstrand, H. STUDIES ON PARATHYROIDS. [Endocrinology, Vol. VI, No. 4, p. 477. J. A. M. A.]

In a woman, aged twenty-two, with a curious and unexplained record of illness, who died suddenly, there were found, besides slight signs of an infection in the air passages, two parathyroid glands showing extreme enlargement, due most probably to autonomous growth. The thymus showed a similar extreme enlargement caused by a supranormal amount of parenchyma and interstitial tissue quite different from that of the juvenile type. It differed from the hyperplastic thymus in exophthalmic goiter in that only the values for cortex and medulla were supranormal, while the total number of Hassall's corpuscles was considerably lower than normal for a corresponding age. There was probably not only a relative but also an absolute decrease in the new formations of Hassall's corpuscles. There was a striking similarity to the thymus in a case of "lymphatismus" described by Hammar. The case affords further support of Hammar's theory that the different components in the thymic parenchyma may independently vary in amount. In a woman, aged fifty-eight, who had an attack of hemiplegia and died about a month later from a second attack, the two lower parathyroids showed enlargement due in all probability to autonomous tumor growth. The thymus was markedly enlarged with a parenchyma value more than ten times the normal. As in the preceding case, the thymus was taken to be hyperplastic, not subinvolved. All the parenchyma components were increased, cortex and medulla to the same degree, but the Hassall's corpuscles to a smaller extent. The values for the Hassall's corpuscles per milligram parenchyma and medulla, respectively, were therefore low. In spite of the differences between them, the cases fall into a sharply defined group in which the hyperplastic thymus differs from that of exophthalmic goiter.

Ritter, C. PARATHYROID BODIES IN RACHITIS AND BONE DISEASE. [Frankf. Zschr. f. Path., Vol. XXIV, No. 1.]

Ritter was led by a serious hypertrophy of the parathyroid bodies in a two-year-old rachitic girl to a careful comparative investigation into the parathyroid bodies in rachitic and nonrachitic children, in Möller-Barlow's disease, in osteogenesis imperfecta, osteomalacia, and in senile osteoporosis. He found that in the first year of life the parathyroids consist of bright mother cells but in rachitis, except in the very early stages, the dark mother cells predominate. In rachitis, furthermore, there was frequently greater development of the connective tissue, hyperemia, sometimes also

edema. In all severe chronic cases there was marked increase in size. There was no microscopic evidence of effect of the kind of nourishment or of the nutritive condition. Bright vascular mother cells were found to predominate in Möller-Barlow's disease. In osteogenesis imperfecta in a seven months fetus 33 cm. long the relatively large parathyroid bodies consisted of parenchyma cells which could not be identified either with the bright or the dark mother cells. They were believed to be incompletely differentiated cells more closely related to the dark cells. In osteomalacia and senile osteoporosis foci of proliferation were found, in one instance consisting of eosinophilic cells, in three cases of the dark mother cell type. These as well as the hypertrophy and formation of dark mother cells in rachitis the writer interprets as due to hyperfunction of the organ in Erdheim's autotherapeutic sense. [J.]

Coda, M. SPASMOPHILIA. [Schweiz. med. Woch., Vol. LII, No. 32, p. 764.]

This résumé of the situation brings into relief the prevailing hypotheses in which the vegetative nervous system determines the symptomatology, chiefly because of perverted endocrine (parathyroid function). The calcium factor is undoubted, but just where in the vegetative or sensorimotor reflex arcs the chief defects become localized is still open to investigation.

Freudenberg and György. AMMONIUM CHLORIDE IN TETANY. [Klin. Wochenschrift, Vol. I, No. 9, p. 410.]

In spasmophilic children, the internal administration of 45 to 90 grains a day of ammonium chloride suppressed the mechanical and faradic nervous hyperexcitability and the manifest symptoms of tetany were prevented. The procedure should be employed only in definite tetany. In one case of post-operative tetany it was shown to be efficacious. In some instances the medication had to be kept up for ten days. Ammonium chloride is pleasanter to administer.

Huldschinsky, Casparis et al. LIGHT THERAPY IN TETANY. [Ed., J. A. M. A., July 21, 1923.]

Good results following exposure to light in the treatment of rickets have been duplicated by similar treatment in active infantile tetany. In 1920, Huldschinsky treated six children suffering with tetany by means of ultraviolet rays, and reported that the symptoms disappeared in from four days to four weeks. Experiments performed by Howland and his associates in the department of pediatrics at the Johns Hopkins University have shown that the calcium concentration of the serum of children with rickets can be raised to the normal level by exposing the children to rays from the mercury vapor quartz lamp. It has also been shown that in cases of active infantile tetany the calcium concentration of the serum is uniformly low. Recently Casparis and Kramer of the same department

exposed five children suffering with tetany to the rays from the mercury vapor quartz lamp. Clinical manifestations of tetany were present in each case, and three of the patients had had convulsions before admission to the hospital. They report briefly that the clinical manifestations disappeared in from three to seven days following exposure to the rays, and that the calcium concentration of the serum increased approximately to normal. As they point out, similar results may be obtained in tetany by the administration of large doses of calcium chlorid. However, such medication does not increase the concentration of inorganic phosphorus in the serum, whereas light treatment increases not only the calcium concentration but also that of phosphorus. If these experiences are confirmed, we shall have available a new, simple and effective means of treating tetany. Moreover, the striking systemic effect of these rays offers an explanation for other conditions in which the calcium metabolism seems to require stimulation. They may even indicate to some extent the manner in which exposure to light effects healing of tuberculous lesions.

Stenvers, H. W. POSTOPERATIVE TETANY. [Ned. Tijds. v. Geneesk., II, No. 10.]

This study reports the oncoming of the tetany syndrome after the second stage of an operation on an enlarged thyroid. The tetany continued with occasional convulsions for a year and a half. After implantation of human parathyroids the patient improved and made a normal pregnancy. All the signs indicating a tendency to tetany subsided nearly or entirely during the pregnancy, but there was some return during nursing.

v. Jauregg, W. TREATMENT AND PROPHYLAXIS OF ENDEMIC GOITER. [Wiener klin. Woch., April 20, 1922.]

According to this study the use of cooking salt containing 2 mgm. of an iodine salt (potassium or sodium iodide) to the kilogram serves to prevent the occurrence of endemic goiter. This form of treatment has the advantage of acting on the whole population in goiter districts, beginning at the moment of reproduction (intrauterine effect) and also of acting continuously throughout life, independently of individual endeavor.

Goetsch, E. FURTHER STUDIES RESPECTING THE PATHOLOGICAL AND CLINICAL SIGNIFICANCE OF DIFFUSE ADENOMATOSIS OF THE THYROID GLAND. [Endocrinology, Vol. 6, January.]

Goetsch gives in greater detail the symptoms and pathology of the condition already described by him as diffuse adenomatosis. The patients are mostly women between twenty and thirty complaining of asthenia, fatigability, loss of weight and strength, nervousness of varying degrees, labile pulse with mild tachycardia, tremor, perspiration, vasomotor instability, mental depression and worry, and often a slight elevation of temperature. They do not present the cardinal signs of adenoma and

exophthalmic goiter. Nothing peculiar is noted about the eyes. The thyroid gland is often slightly or moderately enlarged, but when palpated is fairly firm, elastic, and shows no nodules, having, however, a granular or lobulated feel. There is an increased vascularity on section and the cut surface bleeds profusely. The gland contains a diminished amount of colloid, thus distinguishing it from the thyroid of simple colloid goiter. Quite the opposite from the condition in colloid goiter, puberty hyperplasia, and exophthalmic goiter, microscopic examination shows the striking and characteristic change to be a marked increase of interstitial cells, with associated atrophy and almost complete disappearance of colloid acini. These interstitial cells, Goetsch believes, produce a secretion which causes the colloid acini to atrophy, and this fact, taken with the abundance of mitochondria found, leads him to consider diffuse adenomatosis a milder form of thyroid adenoma. Treatment consists of resection of approximately three-fourths of each thyroid lobe, and considerable success has been attained in a small series of cases.

Wilson, C. M., and Bourne, Aleck W. RELATION OF THE THYROID GLAND TO THE FEMALE PELVIC ORGANS. [Lancet, May 27, 1922.]

The authors present the following conclusions: 1. The basal metabolic rate in most pregnant women, but not in all, is raised above that normally found in nonpregnant women. 2. This basal metabolic rate of different pregnant women varies considerably, but no relationship between these variations in the rate and the clinical condition of the mother is traceable. 3. In the majority of patients, the rise of the basal metabolic rate disappears after delivery, but in a certain number of cases this does not happen, but persists abnormally. The excessive thyroid secretion may produce menorrhagia without pelvic signs. 4. A high basal metabolic rate is also associated with certain forms of menorrhagia, with absence of demonstrable pelvic abnormality. These cases are resistant to all ordinary medicinal and operative measures, but respond readily to exposure of the thyroid gland to X rays. 5. The disappearance of pelvic symptoms is coincident with a fall to the normal basal metabolic rate. Large doses of X rays are not necessary. In a series of cases the patients were treated with initial doses of $\frac{1}{2}$ B or 5 X to each lobe of the thyroid once a week for three doses, the filter being 1 mm. of aluminum and four layers of wash leather. After that, doses of $\frac{4}{5}$ B were given once in three weeks through a filter of 3.5 mm. aluminum and wash leather as before. The rays should not be hard, with a reading not less than 9 on the Bauer qualimeter. The tube used was a Coolidge medium focus, the average doses being seven or eight. Erythema of the skin must be avoided. To avoid the development of myxedema, it is advisable to test the basal metabolism again after six exposures. In some cases more than eight exposures are required, but the necessity for such increased treatment must be determined from time to time by the basal metabolism.

Vignes, H., et Cornil, L. THYROID INSUFFICIENCY AND STERILITY. [*Le Progres Medicales*, June 17, 1922, No. 24, p. 283.]

The authors support the view already put forward by Hertoghe, Kocher, and others that not only may a total or subtotal thyroid insufficiency bring about amenorrhea and sterility, but that much less accented grades of hypothyroidism may cause menorrhagia and sterility. In the former event the sterility is due to definite atrophies in the genital system: in the latter it may be explained on the basis of faulty placental attachment of an already fertilized ovum or to the impossibility of fertilization of the ovum, or still to early abortion. In the case reported by Vignes and Cornil treatment by thyroid extract resulted in a healthy living child after seven years of sterility. They pay particular attention to the histopathology of the placenta and especially to a false endometritis, non-inflammatory, which accompanies these mild hypothyroid states, as a sign of dysgenesis or partial arrest of the reproductive function. [Authors' abstract.]

Lebsche, M. INDICATIONS FOR THYROIDECTOMY. [*Münch. med. Woch.*, LXX, No. 1. J. A. M. A.]

Lebsche points out that the patient suffering from goiter, and not the thyroid itself, is the subject of treatment. Persons who previously had rachitis are very liable to postoperative tetany. In thyrotoxic heart disturbances, it is better to wait until rest and sedatives have improved the condition. True "goiter heart" is ameliorated by operation. Patients with compression of the trachea should be treated surgically. Sometimes the dyspneic condition is latent, because the patient has learned by instinct to avoid overexertion, until an attack of suffocation convinces him of the necessity for an operation. There is no question about the treatment of a malignant struma; cancer is to be suspected, if a goiter starts to grow quickly in old people. The most difficult decision is in children with vascular goiter in which the clinical signs (not only the histologic changes), speak for an exophthalmic goiter, while the aspect of the patient reveals cretinoid stigmas. Determination of the basal metabolism is a valuable aid in such cases. No goiter should be operated on merely for cosmetic reasons.

Falconcini, R. BLOOD PRESSURE IN EXOPHTHALMIC GOITER. [*Riforma Medica*, Vol. XXXVIII, No. 20, p. 465.]

Falconcini found the blood pressure high in all his twelve cases of exophthalmic goiter, but the proportions between the systolic and diastolic pressure seemed to indicate a diastolic hypotension, masked by the tachycardia. The pulse was apparently normal except for its catacrotism, and the instability evident in changes of position and under emotions. In only four of his six cases of well defined exophthalmic goiter was the heart of the shape and size known as goiter heart, and in none of the cases of the incomplete type.

Kendall, E. C. CHEMISTRY AND THE PHARMACODYNAMICS OF THYROXIN. [Annals of Clinical Medicine, I, No. 4, p. 256.]

In the case of myxedematous patients the author holds that a single injection of thyroxin will continue to exert a physiologic effect for five or six weeks. The thyroxin molecule, although stable in some conditions, is very easily destroyed in others; within the body it is stable. It resists boiling and chemical treatment, but is destroyed by bacteria and sunlight. The amount of thyroxin required daily is about 1/200 grain of the pure crystalline substance, administered intravenously. The administration of a larger amount results in a toxic condition resembling the syndrome of exophthalmic goiter. If a single large dose of thyroxin is given, almost no effect is produced, for the reason that the massive dose is excreted before it can exert any action. It is acted on by the liver, and excreted with the bile. The amount which remains in the body is no more than would be available if a small injection had been given. If one assumes that nonexophthalmic goiter produces thyroxin, which permeates from the adenoma into the blood, it would require only from 1 to 1.5 mg. daily to produce marked symptoms. This production of the substance beyond the normal demand, and consequent overflow into the blood, may account for the toxic symptoms in this condition. The author makes the statement, *ex cathedra*, that thyroxin is the only substance contained in the thyroid gland which exerts a physiologic effect. Every molecule of this thyroxin may be assumed to function. The substance is probably a catalyst, which is used over and over, without destruction. It is probable that thyroxin is directly involved in processes of oxidation. Iodin composes 65 per cent of the total molecule. The question which still remains to be solved is whether or not the organic nucleus is active in the complete absence of iodine, and wherein the action of the iodine consists.

Murray, G. R., Wilson, C. M., and Berry, J. DISCUSSION ON EXOPHTHALMIC GOITER. [Brit. M. J., 1922, II, 908. Med. Sc.]

G. R. Murray. The pathology of exophthalmic goiter is discussed and the view that the symptoms are due to an increased secretion from the thyroid gland is reiterated; thus as the secretion is reduced to normal amounts recovery from the malady takes place. There is no clear evidence that the other endocrine glands play a primary part in the production of symptoms, although their activity may, by stimulation, act as a secondary result of the primary hypertrophy.

The actual causation of the exophthalmos is, however, still under consideration. The fact that it cannot be reduced by pressure on the eyeball and persists after death shows that it cannot, to any appreciable extent, be due to venous engorgement. The belief that the protrusion is due to the action of Müller's muscles is regarded as a totally inadequate explanation. Stopford shows that the muscle cannot be recognized macroscopically, and hence so feeble a muscle could have no power to produce proptosis. Stop-

ford gives three reasons for believing that contraction of Müller's muscle is not the cause. (1) It is only composed of a few scattered fibers, and is quite rudimentary and atrophic in man. (2) It is too far from the globe and is generally too separated by compressible fat to have any power to project the eyeball. (3) If it had any action upon the globe it would push it upwards and forwards. In all cases, however, there is an increase of fat in the orbit, even when there is extreme general emaciation. Such an increase is therefore the probable cause. The exophthalmos may persist long after the other symptoms have disappeared.

In the discussion as to the causation which follows, Murray has found that of 300 cases there were 229 women, which is about three to one, whereas in the previous series it was eleven to one; this suggests that the disease is now becoming more common in men. In a few cases there appears to be a family predisposition; in his series this was shown in 9 per cent. A sudden nervous strain was found in only 13 per cent of the cases, and prolonged periods of domestic or financial anxiety or worry in 6 per cent. Overwork was given as a cause in 7 per cent of the cases. It very rarely follows physical injuries, only in 3 per cent of his cases. The occupation of teaching appears to be a predisposing factor, many of the cases being school teachers. For this reason some educational authorities will not admit young women with goiters. A septic focus may sometimes be present, but there is very little evidence that it is a direct cause. In twelve of his cases the condition followed a parenchymatous goiter.

Such cases should therefore be early treated with iodine, but such a treatment is entirely unsuitable for those who already show signs of hyperthyroidism. For these the best method of treatment is rest, suitable diet, X rays or drugs in the very early stages of the disease. Residence at the seaside frequently aggravates the symptoms and this should be avoided. In slight or early cases medical treatment alone is required, and in cases of medium severity a similar course of treatment should be carried out for not less than six months.

C. M. Wilson lays stress upon the fact that a true consideration of the results of the different forms of treatment is hampered by the vague language in which results are recorded. In severe cases a rest in bed was followed by improvement which continued for two or three weeks, the basal metabolic rate falling, for example, from +55 to +30, but at the end of that time there was no further improvement. Three lines of treatment were then open to the physician. He might discharge the patient from hospital better but not cured; he might resort to X rays; and he might call in a surgeon. His own experience in leaving such cases was that a comparatively large number of cases suffered grave and permanent damage to their tissues; he therefore felt constrained to call in the assistance of either the surgeon or the radiologist. The drawback to operation was that the mortality was somewhere in the neighborhood of 5 per cent, but since the disease was a grave one such treatment should only be abandoned if there was a safer alternative.

The result of X rays is still uncertain, but nevertheless he thought it was the safer course to give a six months' trial of X rays before resorting to operation. (He agrees with Walton's view that a case should never be operated upon in the first six months of the disease.) He would, however, add to this that although a patient should not have an operation in the six months, not more than a year should elapse without seeking surgical assistance, if other safer means had failed. He lays stress upon the fact that greater attention should be given to methods of prevention and to treatment in the early stages before the disease has become severe. The use of basal metabolic measures was of extreme value, not only in arriving at a direct diagnosis at a very early stage, when clinical methods may fail, but also in following the progress of the disease and watching the effect of different forms of treatment. He believes that in such early cases X rays should never be used unless controlled by the basal metabolic rate, otherwise hypothyroidism might be induced.

J. Berry agrees that early and mild cases should not be subjected to operative treatment, since many recovered with medical measures. He also warns against the danger of the use of X rays in producing myxedema. (General experience has, however, shown that as a rule the X rays have very little effect, and very few cases have ever been reported in which hyperthyroidism has been so overcome by the X rays as to produce myxedema.) He believes that advanced cases in which the hyperthyroidism has died out and left a fibrosed thyroid and a permanently damaged heart are unsuitable for operation. The ultra-acute cases with great mental excitement are also unsuitable. Cases of myocardial degeneration are especially dangerous, as they are liable to die from sudden heart failure at any time. The course of the grave disease was generally irregular, and it was during a remission in the severity of the symptoms that operation could be undertaken with the best hope of success. He believes that a preliminary ligation of arteries is of great value in fairly acute cases. He lays stress upon the fact that an operation should never be carried out unless the patient has been at rest in a nursing home or hospital for some days. He himself never feels safe in operating upon an exophthalmic goiter, and he had not been able to reduce his mortality to much below 5 per cent.

II. SENSORI-MOTOR NEUROLOGY.

2. PERIPHERAL NERVES.

Thalhimer, W. HERPES ZOSTER; CENTRAL NERVOUS SYSTEM LESIONS SIMILAR TO THOSE OF EPIDEMIC ENCEPHALITIS. [Am. Arch. Neur. & Psych., Vol. 12, July, p. 73.]

A case of herpes zoster is reported by Thalhimer which ended fatally six weeks after the onset of the attack. Certain microscopic lesions found in the central nervous system are similar in some respects to the

type of lesions present in the brain and spinal cord of patients dying from epidemic encephalitis or from poliomyelitis.

Hannecart, A. EPIDURAL INJECTIONS. [Arch. Fr. Belg. d. Chir., June, 1923; J. A. M. A.]

Hannecart relates that sciatica permanently subsided in the eleven cases treated by epidural injection of about 150 c.c. of physiologic saline solution. Similar relief was obtained in cases of pains in the leg after trauma or childbirth. One man had been incapacitated for three weeks by pain in the ankle. The epidural injection cured it at once. Two of the patients with sciatica had a recurrence five or six months later which yielded anew to the epidural injection. In one case pain and swelling of the malleolus had recurred at times for more than five years, and finally continuous lancinating pains totally incapacitated the man. All kinds of treatment had been applied without relief, until epidural injection of 200 c.c. cured the pains, the swelling subsided, and the purplish, tender skin became normal. Except for the old ankylosis, the cure was complete. Rebellious multiple and painful varicose ulcers on the leg of one woman healed over gradually after the epidural injection, the largest ulceration, measuring 3.4 cm., had subsided to 0.6 cm. in less than a month and clinically normal conditions were restored before the end of the second month. The epidural injection in these last two cases had evidently modified trophic and vascular conditions. The injection begins to be painful after 30 or 40 c.c. have been introduced, but he continues to the bearable limit, from 100 to 200 c.c. or even 240 c.c. A local anesthetic might be injected beforehand. Experiments on the cadaver have shown that the foramina act as safety valves, but it is wise to inject the fluid slowly after 50 c.c. His experience with epidural anesthesia has also been favorable. He thinks that with perfected technic we may be able to inject the entire epidural space and thus anesthetize all the spinal nerves. The conservation of the motor function with the epidural technic, and the noninclusion of the pneumogastric insure noninterference with the respiration.

Arcangeli, M. ON MUSCULAR ATROPHY OF PERIPHERAL ORIGIN. [Arch. ital. di chir., VII, 329; Med. Sc.]

This paper is the first part of a general study and deals only with the effects of section of a nerve-trunk upon the end-plates in the muscle concerned. The reproductions of photomicrographs give evidence of the care and skill with which the histological work was performed. A first series of experiments on guinea-pigs, while it served to supply standards of comparison, demonstrated merely that high section of the sciatic in that animal has no effect upon the gastrocnemii, which obtain their nerve-supply adequately, if not exclusively, from other sources. The further experiments were conducted upon the soleus after section of the sciatic, and the muscles of expression after dividing the facial, both

in rabbits. In every case the corresponding muscles of the unaffected side were subjected to identical preparation and examined serially simultaneously. The conclusions arrived at, using the gold-chloride method with ample controls, are that section of the sciatic in rabbits results in degenerative changes of the end-plates, noticeable after less than 24 hours; these are increasingly marked during the second, third, and fourth days; from the fifth to the tenth days they are severe and practically universal; while after that the plates apparently disappear altogether. In the case of the muscles of expression the degeneration is similar but much more rapid, so that the plates can no longer be recognized by the sixtieth hour. The alterations consist essentially of progressive fragmentation of the peripheral expansions of the nerve-fibers, which quickly become granular and finally fail to reduce the gold-chloride at all.

Muir, E., Landeman, E., Roy, T. N., and Santra, I. SPREAD OF LEPROSY THROUGHOUT BODY FROM INITIAL LESIONS. [Ind. J. of Med. Res., July, 1923.]

This study tends to prove the spread that the leprosy bacilli takes place through the lymph channels. As a rule the superficial layers of the skin are first infected. Later the infection spreads to the deeper layers. Muscle and bone changes are due to fibrous pressure on the nerve trunks. Nerve leprosy has a relation to skin leprosy, the one tending to increase while the other tends to diminish.

Thompson, T. J., and Carr, I. L. BLOOD CHANGES IN POLYNEURITIS. [Biochem. J., April, 1923.]

These authors have studied the variations in the amounts of different constituents of the blood of chickens during the development of polyneuritis. Polyneuritis was induced by feeding on a ration of boiled polished rice, filter paper and crushed marble. The chickens decreased in body weight and lost their appetites. They were laying at first, but gradually the number of eggs lessened and the chickens ceased to lay eggs. Sooner or later paralysis occurred. Blood was taken from the brachial artery under the wing. After some weeks the time of coagulation became so brief that it was not possible to obtain ten cubic centimeters of blood needed for the estimations. The authors determined the quantities of sugar, uric acid, creatinin and total nonprotein nitrogen in the blood. They found considerable variations in the amounts of these constituents in the chickens before the experiment. No constant or considerable changes were noted in the percentages of sugar or nonprotein nitrogen as the experiment progressed. The percentage of uric acid and of creatinin increased in the blood shortly before the onset of polyneuritis. Autopsies of those chickens which died, revealed deterioration in the heart, kidneys and liver. The authors conclude that disintegration of these organs accounts for the increased amounts of uric acid and creatinin in the blood. When the paralysis was so advanced that the

chickens could not walk, they were given thirty grammes of yeast daily. Three out of eight chickens recovered.

Läwen, A. PARAVERTEBRAL ANESTHESIA IN DIAGNOSIS. [Zent. f. Chir., Mar. 24, 1923.]

A report of 150 cases in which procain was used to block the nerve innervation of a given organ. The method is of value not only for differential diagnosis in affections of the stomach, gallbladder, appendix and kidney, but the relief from pain is a further advantage of this anesthetization by the paravertebral method.

Stein, F. FLACCID PARALYSIS OF THE BRACHIAL PLEXUS AFTER NARCOTIC. [D. Ztschr. f. Nervenhlk., LXXVIII, 1, 2.]

An overdose of an unknown narcotic followed by a 19 hours' sleep produced a complete flaccid paralysis of the right arm with anesthesia or hypesthesia to all qualitative sensations in a man whose right side from birth was not so well developed as the left. A portion of the inner side of the upper arm was removed. All of the muscles supplied by the brachial plexus proved to be involved, the deltoid however was most affected probably because of direct injury through pressure. The trapezius, the levator scapulae and the rhomboidei were spared. The disturbances of sensibility soon disappeared but the loss of motor function remained for some time. Muscular atrophy was evident.

Grubal, P. TARDY ULNAR PARALYSIS. [Arch. Fr. B. d. Chir., Mar., 1923.]

The roentgenograms in a typical case demonstrated that the ulna had become displaced, like the astragalus in a Dupuytren fracture, and in consequence the ulnar nerve was stretched and irritated. Shifting the nerve to the front of the condyle leaves it exposed to further irritation. The simplest and most effectual treatment is by resection of a wedge from the humerus above the condyle. This corrects the valgus deformity, restores practically normal conditions for the ulnar nerve, and the paralysis subsides.

Erlacher, P. CONGENITAL PLEXUS PARALYSIS OF THE SHOULDER. [Ztbl. f. Chir., No. 25, 1923.]

Erlacher considers every birth paralysis a true paralysis caused by injury of the nervous conduction. The injury takes place in many cases not during the birth but within the uterus by the pressing of the shoulder against the neck and pressure against the plexus.

Jorge, J. M., and Gamboa, M. TOXIC PARALYSIS OF LEG. [Arch. L. Am. d. Ped., Feb., 1923.]

Clinical case of a seven-year old boy poisoned by a large dose of bichloride of mercury. After two days of anuria the right leg was paralyzed. Under massage, electricity and heliotherapy the use of the

leg was regained toward the ninth month, but the muscles still give the reaction of degeneration. Toxic poliomyelitis is given as explaining the difficulty.

3. SPINAL CORD.

Acuña, M., and Casaubôn, A. MENINGEAL FORM OF ACUTE POLIO-MYELITIS. [Arch. Lat.-Am. d. Ped., August, 1922, XVI, No. 8.]

The clinical history of two cases is given in detail. In one purely meningeal symptoms prevailed, with no focal symptoms at any moment. The differential diagnosis in this type can never be positive without necropsy, but the complete recovery is strong presumptive evidence. Lymphocytosis and abnormally high albumin content in the lumbar puncture fluid suggest tuberculous meningitis, but are never quite so pronounced as in the latter. The second case showed both meningeal and paretic signs.

Lundi, C. A CASE OF ACUTE MYELITIS OF UNKNOWN ORIGIN. [South African Med. Jl., 1922.]

The patient, a hitherto healthy man of fifty except that he suffered from chronic asthma, had been motoring through Basutoland and the Free State with his niece and her husband. On one occasion the car stuck in a muddy spruit and he took off his boots and socks to help to push it out. When he returned to his niece's house an attack of acute bronchitis came on which was probably the result of his exposure in the spruit.

When first seen on January 16, 1922, he was still suffering from acute bronchitis for which he was taking an expectorant mixture given by another doctor five days previously, but his chief complaint when seen was a numbness in the hands and feet, as well as a slight loss of power in them also. On examination tactile sensation as well as sensations of pain, heat and cold were not appreciably impaired, nor was the grip of the hand feeble. Knee jerks, however, were completely gone and the pupils gave the Argyll-Robertson reaction. The gait was markedly ataxic and Romberg's sign was present. A diagnosis of locomotor ataxia was therefore made and a correspondingly bad prognosis given, but, of course, not one of early death. To avoid unpleasant inquiries into a specific history a specimen of blood was taken for a Wassermann. The arrangement made as best in the circumstances was to keep him in bed a few days and treat him with massage and hot bags to his limbs, in the hope that a temporary improvement would occur and enable him to travel home. Failing any improvement in two days or so he was to wire for his own doctor to come and accompany him home. His condition, however, changed so much for the worse during the day that his friends requested a second trip and arranged for me to take him to a nerve

specialist in Johannesburg. When seen that evening he was no longer able to stand and swallowing was a distinct difficulty. His cough had lost its tone and his arms and legs had markedly lost power. There was paralysis of the intercostal muscles. It was doubtful if he would be able to travel as far as Johannesburg, but the arrangement was allowed to stand provisionally, and the following afternoon's train fixed upon for traveling by.

When seen next day at noon he was so much weaker that it was obvious he could not travel safely farther than to Bloemfontein, the nearest town where there was a nursing home in which he could get the necessary constant care that was impossible on the farm. His chief complaint at this time was that he could not cough, and as he still had acute bronchitis this caused him much distress. The inability to cough suggesting paralysis of the vocal chords, his larynx was examined by a throat specialist on arrival in the home, but the chords were acting feebly and not completely paralyzed. In fact, the lack of tone and power in the cough seemed rather to be due to the paralysis of the intercostal muscles than to paralysis of the chords, for by this time the intercostal breathing was completely abolished. He was treated with hypodermic injections of atropin gr. 1/150 every four hours to prevent waterlogging of the lungs, coupled with strychnine gr. 1/30 to keep up his strength. He was seen by a nerve specialist in Bloemfontein but nothing further was suggested by him. A nerve specialist in Johannesburg was wired for but a series of unfortunate mistakes in the telegrams prevented him from arriving in time to see the patient, who died on the morning of the 19th of waterlogging of the lungs through inability to cough up the bronchitic sputum. The Wassermann report which arrived after his death was *slightly positive*, which, in absence of clinical signs, may be considered negative.

The case is not a common one and the cause still remains obscure. It was not sudden enough in onset to be due to hemorrhage and was far too rapid in its progress to be locomotor ataxia, which in some respects it at first resembled. It must apparently have been due to some acute infective agent such as causes Landry's paralysis or infantile paralysis or encephalitis lethargica, or it might have been a case of thrombosis, though that, of course, would be due ultimately to an infective agent. Death was certified to be due to myelitis, probably infective. [Author's abstract.]

Wright, J. H., and Craighead, E. M. INFECTIOUS MOTOR PARALYSIS IN YOUNG RABBITS. [Journal of Experimental Medicine, Vol. XXXVI, No. 1, p. 135. J. A. M. A.]

The attempt made by Wright and Craighead to infect young rabbits and guinea pigs with material containing in all probability the virus of human infantile paralysis failed. Incidentally, and presumably acci-

dentally, a paralytic disease hitherto undescribed was observed in young rabbits associated with the presence of an organism showing certain definite characters. This organism is found widely distributed in the organs of the affected animals and can be demonstrated in the urine. The active destruction by the organism of the nerve cells of the spinal cord is particularly striking, and gives complete explanation for the paralysis observed clinically. With the organism present in the urine the spread of the disease by contact can easily be understood. The transfer of the infection from animal to animal by flea bites is possible but not probable. The nature of the observed organisms is in doubt. They represent probably an intermediate stage in the life history of some protozoan parasite.

Litvak, Regan and Regan. THE COLLOIDAL-GOLD REACTION IN ACUTE POLIOMYELITIS. [Am. Jl. Dis. Child., 1923, XXV, 76.]

Regan, Litvak and Regan studied 42 cases of acute poliomyelitis, in which a study of the colloidal-gold reaction was carried out on 132 specimens of spinal fluid. There was always a reaction of colloidal-gold solution in the case of every poliomyelitic fluid taken during the acute stage of the disease. This reduction was constantly in the same zone; the zone of low dilutions or the so-called syphilitic zone. In 88 per cent of the spinal fluids examined, the reaction occurred in the first six dilutions between 1 to 10 and 1 to 320. In 14 spinal fluids the reaction extended to the seventh dilution, 1 to 640. These patients more or less characteristically presented marked polyneuritic or meningitic symptoms or else pronounced paralysis. The average curve or reaction showed very similar characteristics in the first and second weeks of the disease. A gradual decline in the curve was then noted. In no instance was a normal reaction encountered before the end of the third week of the illness. In 23 patients the spinal fluid was examined as late as the eighth week, and 15 or 65 per cent had become normal by that time. Cases in which a normal reduction returned early, from the third to the seventh week, were mild types of the disease, while those in which the curve remained elevated beyond the eighth week had usually polyneuritis or extensive and slowly improving paralysis or both. The reaction showed no distinctive points in the fatal cases, and therefore was of no value in prognosis in this regard. The positive reaction bore no constant relation to the presence of globulin in the spinal fluid nor to its disappearance. There was no close ratio between the number of cells per cubic millimeter in the spinal fluid and the test, but as the cell count decreased the colloidal-gold curve subsided, but somewhat more slowly, remaining elevated for several weeks after the cell count was normal. With the subsidence of the colloidal-gold curve there was usually an accompanying improvement in the patient's general condition, the paralysis, the meningitic symptoms, and the polyneuritis. It would seem that the return of a

normal reduction of colloidal gold indicates approximately the end of the acute stage of the disease. As this coincides with the improvement noted clinically, this termination of the acute stage can readily be determined by watching the symptoms. In differential diagnosis the colloidal-gold reaction should be utilized in conjunction with history, symptoms and other laboratory data.

Souques and Alajouanine. PROGRESSIVE MUSCULAR ATROPHY. [Bulletins de la Société Médicale des Hopitaux, Vol. XLVI, p. 691. J. A. M. A.]

The young man died eight months after the onset of the afebrile disease. Inoculation of two rabbits and six guinea pigs resulted in pseudoparetic amyotrophy, with tachycardia in one rabbit. It developed six months after it had been inoculated with an emulsion of the cervical spinal cord from the clinical case.

Henderson, M. S. SURGERY IN INFANTILE PARALYSIS. [Minn. Med., December, 1922, V, No. 12. J. A. M. A.]

Henderson states that surgery is indicated only in the residual paralysis following poliomyelitis and only about 25 per cent of such patients can be helped by surgical procedures. As a rule, manipulations precede tenotomies, and manipulations with tenotomies, osteotomies, the last named being resorted to only for correction of skeletal deformities. Arthrodeses are occasionally indicated but should be performed only after a careful consideration of the power left so that the patient may use the fixed point to advantage. Lastly, but by no means least, the social status and the habits of the patient must be considered. Plastic operations on tendons are useful, but are applicable in only a small percentage of cases. A weak muscle must not be expected to do the work of a stronger muscle, particularly when it is placed in a new position and is usually at a mechanical disadvantage. Astragalectomy is the operation of choice for calcaneovalgus and in certain other conditions, but should always be accompanied by a posterior displacement of the foot.

Jakob, A. SPASTIC PSEUDOSCLEROSIS, CLINICALLY CLOSELY RELATED TO MULTIPLE SCLEROSIS. [Med. Klin., 1921, No. 13.]

The author reports four cases in which the disease picture stood between the spastic systemic diseases and those located in the corpus striatum (Westphal-Strümpell pseudosclerosis, Wilson's disease, chorea). Clinically there were inability to walk, without true paralysis of the legs, absence of abdominal reflexes with outspoken pyramidal symptoms (active patellar reflex, Babinski) frequently bladder and rectal incontinence and athetoid movements, psychically confused states or catatonic pictures. Anatomically there were disseminated foci of degeneration chiefly in the pyramidal tracts, corpus striatum and thalamus, that is,

the entire motor system. Syphilis had an etiological relation in two cases, possibly chronic malaria and alcoholism in the others.

Long, E. MULTIPLE SCLEROSIS AND ITS ETIOLOGY. [Sch. med. Woch., February 1, 1923.]

Basing his statement on statistics, the author argues that only 20 or 25 per cent of the cases diagnosed as multiple sclerosis are of the classic form, with all the symptoms described by Vulpian and Charcot. Recent experiments have caused some modification in the conception of the etiology of this disease: Inoculations of the cerebrospinal fluid of multiple sclerosis patients and the nerve substance seemed to prove that there is a specific virus which produces some types of the disease. The therapeutic promise of arsphenamin has not made good.

4. MIDBRAIN, CEREBELLUM.

Mertens, V. E. MULTIPLE CEREBELLOPONTINE TUMORS. [Bei. z. klin. Chirurgie, 1924.]

This study reports the successful removal of both a sarcoma and a cystic tumor from the cerebellopontile angle.

Beijerman, W. AFFECTIONS OF THE CEREBELLUM AND CORPUS STRIATUM. [Psychiat. en Neurol. Bladen, Vol. 27, No. V, September-October, p. 293.]

Beijerman reports a case of Marie's cerebellar heredoataxy, one of the akinetic pallidum-syndrome, and one of the athetotic striatum-syndrome: the two latter to be published later in the "Bladen." The patient, fifty, with Marie's ataxy began to suffer eight years ago with a drunkard's gait; later came disturbances of swallowing, and still later of speech. A sister, forty-seven, has had similar symptoms for ten years. Probably patient's father and paternal uncle also had this disease, though in the father's case sclerosis multiplex was considered. Patient's grandfather was "nervy" in the legs; an aunt, who walked well, yet stammered badly. The patient had dysmetria, oscillating, asynergia, and adiadokokinesis, a definite nystagmus, and binocular diplopia not to be attributed to atrophy of any one ocular muscle. Definite hypotonia in arms, increased kneejerks, and presence of Stewart-Holmes resistance phenomenon. No optic atrophy. Left Babinski reflex, but this is not always definite. [Leonard J. Kidd, London, England.]

Seemann, M. CEREBELLUM AND SPEECH. [Cas. lek. Cskzch., December 22, 1923. J. A. M. A.]

Seemann examined children with late development of speech. He found congenital deficiencies of the vestibular apparatus together with other signs described by Precechtel in these cases; frequent abnormal presentation at birth, and delay in learning to walk. He gives the reasons

for his assumption of deficient cerebellar function, which accounts for the late development of speech. Speech is primarily an expressive movement, and therefore depends, like other coördinated movements, on the cerebellar function.

Bailey, Percival. CEREBELLAR SYMPTOMS PRODUCED BY SUPRASSELLAR TUMORS. [*Am. Arch. Neur. & Psych.*, Vol. 11, February. J. A. M. A.]

The main source of difficulty in the differential diagnosis between supratentorial and infratentorial tumors lies in the equilibratory disturbance which both may cause. Three cases of suprasellar tumor are described by Bailey which gave rise to symptoms of cerebellar disorder, mainly equilibratory, possibly from interference with efferent pathways of the cerebellum in the region of the incisura tentorii, or to interruption of cerebrocerebellar connection.

Philibert, A., and Rose, F. THE SYNDROME OF THE POSTERO-INFERIOR CEREBELLAR ARTERY. [*Le Progrès Médical*, No. XV, April 12, p. 229, 1 fig.]

The writers' case describes some rather unusual features, and the degree of recovery is noteworthy. The posteroinferior cerebellar artery, a branch of the vertebral, supplies the retroolivary region of the bulb; it traverses the roots of the hypoglossal nerve, and winds round or traverses those of the vagus to arrive on the sides of the fourth ventricle in the angle which separates the bulb from the cerebellum; there it disappears in the depths and divides into an internal branch for the vermis, and in one or two branches empties itself on the inferior aspect of the cerebellum. The patient was a man of sixty-one who had for some time had transient attacks of vertigo. On rising from bed one morning he had slight disequilibrium, could hardly keep on his legs, and had a sensation as if he would fall to the left. He had moderate hypertension. In the course of a few hours he had left lateropulsion, a left Bernard-Horner oculopupillary syndrome, and a right thermoanesthesia which spared the face, with subjective cutaneous sensations on the right side. From the onset there were vertigo, disturbances of phonation and deglutition, but no velopalatine hemiparesis. Under hypotensive treatment there was progressive regression of the syndrome, with many attacks of hypertension which yielded to treatment. About two months after the onset all symptoms had gone, except the ocular sympathetic syndrome which in its turn eventually went away. In this case there was no destruction of tissue, but merely a suspension of function of a limited territory of the left side of the bulb by a spasm of the left postero-inferior cerebellar artery, or rather of a certain number of its branches, for its trunk was not affected by the spasm, as certain symptoms of the complete syndrome were absent. Thus, the absence of anesthesia, complete or dissociated, of the left hemi-face indicates the escape of the descending sensory root

of the trigeminus and of most of the central fibers which issue from the sensory nucleus of the trigeminus. Yet it is probable that a few of these central fibers were affected, for in the early days after the onset there was a very slight hypoaesthesia. The pains and other subjective sensory symptoms in the anæsthetic territory, though inconstant, have been fairly often described previously. The absence of any residue of functional disability is doubtless due in this case to the absence of any softening of the cerebellar and bulbar structures. [Leonard J. Kidd, London, England.]

Leiri, F. THE CEREBELLUM AND THE ANTAGONIST MUSCLES. [Finska Läk. Hand., December, 1923.]

The cerebellum, this study tends to show, functions for the behavior of the antagonists in muscular action. It controls both sets of muscles, checking one as it promotes the action of the antagonist. The cerebellum must be classed as an organ of sense like the static labyrinth and the cortex.

Allen, William F. DISTRIBUTION OF THE FIBERS ORIGINATING FROM THE DIFFERENT BASAL CEREBELLAR NUCLEI. [Jl. Comp. Neurology, April 15, Vol. 36.]

From the description of the results of the previous experiments and discussion, the following conclusions seem warranted for the brain of the guinea pig:

1. All of the efferent cortical cerebellar fibers are distributed to the basal cerebellar nuclei, except a few from the vermis, which pass medially to the corpora restiforma, in what was designated as the inner cerebellar funiculi, to the lateral vestibular nuclei. The majority of the vermis fibers supply the fastigial nuclei; while those from the hemispheres go principally to the nucleus intermedius (nucleus interpositus or N. globosus and N. emboliformis) and to the nucleus dentatus.

2. A varying amount of very fine black granules has been recorded in this and in the previous paper for certain peripheral tracts, namely, the brachium pontis, commissura posterior, tractus opticus, pedunculus corporis mamillaris, radix nervi trochlearis, and other motor roots. Since similar minute granules appeared in equal number in other Marchi series in which no injury could have happened to these fibers, it is the opinion of the writer that these minute black granules may be a precipitate that has nothing to do with the degeneration of these fibers.

3. The brachium conjunctivum originates solely from the nucleus dentatus (lateralis) and the nucleus intermedius (nucleus interpositus or N. globosus and N. emboliformis); the distribution of fibers from either nucleus is apparently the same. There is no evidence of any Purkinje cell fibers entering the brachium conjunctivum.

4. In the colliculus inferior segment all of the brachium conjunctivum

fibers which reach the level of the decussation decussate, forming the commissure of Wernekink directly dorsad of the ganglion interpedunculare, but send no fibers to this nucleus. Before decussating, the brachium conjunctivum supplies the dorsal and lateral formatio reticularis with a number of fibers. After decussation the brachium conjunctivum separates into a main cephalic bundle and a minor caudal bundle, the latter according to van Gehuchten is formed from the bifurcation of some of the commissural fibers.

5. The brachium conjunctivum descendens in passing caudad, dorsal to the lemniscus medialis, to the level of the nucleus olivaris inferior, conforms to Wallenberg's and van Gehuchten's descriptions of the course of this tract for the rabbit. In the pons region it is distributed to the ventral and median formatio reticularis—a region not supplied by the opposite brachium conjunctivum, and in the medulla it continues to supply the same region of the formatio reticularis. There is no evidence of any of the brachium conjunctivum descendens fibers being distributed to any of the pontine nuclei or to any of the motor nuclei of the medulla.

6. Fibers from the main or ascending brachium conjunctivum permeate every part of the nucleus ruber, where many trunk fibers and collaterals end. That part of the brachium conjunctivum situated between the decussation and the nucleus ruber sends off numerous fibers to the formatio reticularis dorsad of the nucleus ruber, some of which enter the nucleus nervi oculomotorii as described by Klimoff and van Gehuchten, while others enter the dorsal small-celled portion of the nucleus, namely, the Edinger-Westphal nucleus, and the adjacent central gray. Many fibers continue through the nucleus ruber to become the brachium conjunctivum thalamic fibers. Some of these fibers form a fasciculus, the brachium conjunctivum dorsale, which terminates in the nucleus medialis thalami at the same level that the corresponding dorsal fasciculus of the lemniscus medialis ends in the caudal portion of the nucleus lateralis thalami. The main bundle of the brachium conjunctivum thalamic fibers continues cephalad in its median position, giving off fibers enroute to the zona incerta, median portion of the formatio reticularis ventralis and to the regio subthalamica. Ultimately the main brachium conjunctivum thalamic fasciculus fibers radiate dorsally through the central median division of the nucleus ventralis thalami (N. Ven. T. [b]) to enter the lamina medullaris medialis (internus of Probst), where a few fibers pass medially to end in the gray dorsad of the most median division of the nucleus ventralis thalami (N. Ven. T. [c]), but the great majority pass laterally and ventrally to terminate in the cephalic end of the largest and most lateral division of the nucleus ventralis thalami (N. Ven. T. [a]), which nucleus Probst is correct in placing as the chief terminal for the cerebellar thalamic fibers.

7. There is apparently no overlapping of the fibers of the brachium

conjunctivum with those of the lemniscus medialis, either in their cephalic course or at their terminal endings. As noted by Probst, the cephalic course of the brachium conjunctivum is distinctly median and dorsal to that of the lemniscus medialis. Very few, if any, of the lemniscus medialis fibers are distributed to the nucleus ruber, formatio reticularis, and to the regio subthalamica, while a large number of the brachium conjunctivum fibers end in the nucleus ruber, formatio reticularis and in the regio subthalamica. The great mass of lemniscus medialis fibers terminate in the caudal end of the most lateral of the ventral thalamic nuclei (N. Ven. T. [a]), while the majority of the brachium conjunctivum thalamic fibers continue cephalad median to the caudal end of this nucleus to finally end in the same nucleus, but entirely cephalad of the termination of the lemniscus medialis fibers. Both the thalamic brachium conjunctivum and the lemniscus medialis send off dorsal fasciculi at the caudal end of the thalamus; the more median brachium conjunctivum bundle ends in the nucleus medialis thalami and the more lateral lemniscus bundle terminates in the caudal end of the nucleus lateralis thalami. There is no evidence of any brachium conjunctivum fibers ending in the nucleus lateralis thalami.

8. The destination of the main outgoing tract from the cerebellum, namely, the brachium conjunctivum, is to the formatio reticularis of the brain stem, especially the nucleus ruber, and to the median and ventro-cephalic portions of the thalamus.

9. With the exception of the few fibers which originate in the cortex of the vermis and go to the nucleus nervi vestibularis lateralis, all of the fibræ cerebello-bulbares of one side take origin from the nucleus fastigii of the same and opposite sides (though chiefly from the same side) and might well be designated as fibræ fastigio-bulbares. In passing ventrally to the nucleus nervi vestibularis lateralis, they follow the corpus restiforme, medially, in what was designated as the internal cerebellar funiculus. A lateral cephalic bundle of these fibers, which encircles dorsally the proximal end of the brachium conjunctivum, the fasciculus uncinatus or the fasciculus arcuatus Russell, enters the nucleus nervi vestibularis lateralis, laterally, but soon becomes mixed with the more median fibræ cerebello-bulbares. A number of the fibræ cerebello-bulbares end in the nucleus nervi vestibularis lateralis, but many continue caudally in the radix descendens nervi vestibularis as the tractus cerebello-bulbaris to the level of the decussation of the pyramids, and enroute distributed many fibers to the vestibular nuclei and to the dorsal formatio reticularis. It was recorded that many fibræ cerebello-bulbares pass medially through the nucleus nervi vestibularis lateralis to the dorsal formatio reticularis; a few enter the fasciculi longitudinales mediales and were traced to the nuclei nervi oculomotorii. There is a condensation of these fibers in the dorsal part of the formatio reticularis lateralis, which suggests van Gehuchten's

posterior cerebello-bulbar tract and Luna's "fascio cerebello spinale laterale." No cerebello-bulbar fibers were traced to the spinal cord, and nothing corresponding to Luna's "fascio cerebello spinale mediale" was observed in the medulla region. Also there is no evidence of any cerebellar fibers ending in the inferior olive.

10. Functionally there are apparently two distinct cerebellar nuclei in mammals, a lateral one composed of the nucleus dentatus and nucleus intermedius or interpositus (*N. emboliformis* and *N. globosus*) and a median one, the nucleus fastigii (*tecti*). The lateral nucleus receives no direct spinal or cranial nerve roots and no fibers from the spinal cord and medulla. Its afferent supply is from the cerebellar cortex, chiefly from the hemisphere. It gives origin to the brachium conjunctivum. Its function as suggested by this relationship appears to be mainly one of correlation and strengthening. The connections of the median nucleus are chiefly with the vestibular system. It receives both direct vestibular root fibers and fibers from the vestibular nuclei. It may receive spino-cerebellar fibers, has cortical connections from the vermis and probably from the basal vestibular cortex. It gives rise to most of the fibræ cerebello-bulbares. This relationship suggests both a reflex and correlating vestibular center. (J.)

Hanhart. CONSTITUTION AND HEREDITY IN HEREDITARY ATAXIA (46 NEW CASES OF FRIEDREICH'S DISEASE). [*Schweiz. med. W.*, 1923, Nos. V, VI.]

The author found the 46 cases which he uses for this study divided among 21 families, 18 of them in Switzerland. He considers the ataxia as a prototype of a heredodegeneration. The hereditary process he finds is recessive and the blood relationship only an accessory factor not the direct cause of the inheritance. He discusses the method for such researches and he himself investigates the pathogenesis, the part played by alcohol, etc.

Citelli. CEREBELLAR HAEMATOMA COMMUNICATING WITH THE SIGMOID SINUS. [*Arch. Internat. de Laryngol., d'Otol. et de Rhinol.*, February, 1924, p. 139.]

This is the clinical history of a seventeen-year-old boy who, after an attack of influenza, suffered from a mastoid osteomyelitis which supervened on chronic suppurating otitis media. A complete mastoidectomy was performed, exposing a length of sigmoid sinus which appeared healthy and was consequently not explored. The mastoid wound progressed well and the patient did well for four weeks, but on the twenty-eighth day after the operation the skin flap was found to be very swollen and there was much discharge from the wound. There was horizontal nystagmus equal in either direction, and disturbance of equilibrium; the voice had almost disappeared. After twenty-four more days of careful treatment the condition was very

much better as regards the operation area, but the disturbance of equilibrium and the nystagmus persisted. The patient complained of headache and slept badly. Facial paresis was noticed and passed into complete paralysis a few days later; the headache increased and depression became very marked. There was spontaneous past-pointing to the affected side, and Romberg's test gave a swaying of the trunk that was not affected by changes in the position of the head. There was no rise of temperature. The optic fundus was unaltered except for slight congestion of the disc. Reviewing these signs and symptoms, and especially the facial paralysis, the author diagnosed cerebellar abscess. On exploring the posterior fossa he found a bluish-looking dura mater below the transverse sinus, from which, when incised, came a gush of venous blood. The wound was immediately packed with gauze and the operation stopped. The facial paralysis was much relieved at once and entirely disappeared in a few days, as did all the other symptoms, the patient being completely cured. The author lays stress on the appearance of the paralysis of the facial nerve at some interval after the performance of a radical mastoid operation, and considers that this is a sign of pressure in the region of the internal auditory meatus. He has found this condition three times—due once to hematoma and twice to abscess of the cerebellum; in these cases facial paralysis came on some time after a radical mastoid operation and was associated with nystagmus and disturbance of equilibrium.

Herrick, C. J. ORIGIN AND EVOLUTION OF CEREBELLUM. [Am. Arch. Neur. and Psych., Vol. 36, June. J. A. M. A.]

This is a careful and exhaustive study made with the view of discovering what functional factors were primitively concerned in the initial differentiation of the cerebellum from preëxisting bulbar structures and some of the steps by which additional functional systems of diverse kinds were darwn into the cerebellar complex. Some light may be shed on the great problems of the analysis of higher cerebellar functions. Herrick approaches the problem from the standpoint of comparative anatomy, embryology and physiology. The conclusions to be drawn from this study are that the cerebellum does not appear to participate in the analysis of sensory impressions for determining what the appropriate response shall be; but after the character of the response has been established, unconsciously in lower centers or consciously in the cerebral cortex, the cerebellum participates in the execution of the movements. Its own activities are wholly unconscious. The cerebellum functions not merely as a chain reflex in response to proprioceptive reports of bodily movements after they have happened, but the primary sensori-motor centers (and especially the cerebral cortex) discharge collateral impulses into it, so that this adjustor can act in anticipation of the actual response and throw its own machinery into gear with all the lower motor apparatus necessary to execute it properly.

Warner, W. P., and Olmsted, J. M. D. THE INFLUENCE OF THE CEREBRUM AND CEREBELLUM ON EXTENSOR RIGIDITY. [Brain, Vol. 46, July. Med. Sc.]

Using cats, and performing acute experiments only, the authors found that ablation of one cerebral hemisphere cephalad to the thalamus resulted in the development of a crossed extensor rigidity, not involving the neck or tail. Ablation of one excitable motor cortex, previously determined by stimulation, was not followed by any rigidity. Ablation of one frontal cortex (the cortical area lying ventral and slightly mesial to the excitable cortex), the motor cortex remaining excitable, was followed by crossed extensor rigidity. After decerebration cephalad to the anterior corpora quadrigemina, stimulation of the mesial part of the cut surface of either cerebral peduncle was followed by inhibition of the crossed extensor rigidity. The same result followed unilateral decerebration and stimulation of the cut peduncle. Further, stimulation of the cut surface of the frontal lobe after simple frontal cortex extirpation was followed by inhibition of the crossed rigidity. The influence of the cerebellum was also investigated, and it was found that injury to the cerebellar cortex or removal of one-half of the tentorium caused ipsilateral extensor rigidity. Unilateral cerebellar ablation caused disappearance of the rigidity on the same side. Stimulation of the anterior surface of the vermis produced general disappearance of the rigidity. Finally, transection of the brain stem caudad to the anterior limits of the posterior corpora quadrigemina caused sudden disappearance of extensor rigidity. The authors conclude that there are tracts in the cat's brain carrying impulses which inhibit extensor rigidity, and that decerebrate rigidity results from interruption of these impulses. The tracts arise in the frontal cortex, pass through the mesial part of the cerebral peduncle, and enter the cerebellum through the crossed middle peduncle. It will be seen that the most striking observation is that of the development of crossed extensor rigidity following simple ablation of the frontal cortex. This result is one which clinical neurological thought may be said to have anticipated, but which has so far awaited experimental verification. In other respects the results obtained are not all in accord with the work of Sherrington and of Magnus, and it therefore is clear that what is new in these observations demands confirmation before it can be finally accepted. In the introduction, the authors quote statements as to the reflex arc of decerebrate rigidity, which the work of Magnus and his collaborators have shown to be inaccurate, and although they refer to this work, it is clear that its results are not embodied in their thought. [F. M. R. Walshe.]

III. SYMBOLIC NEUROLOGY.

3. PSYCHOSES.

Timme, W. EPILEPTIC RESEARCH. [Association for Research in Nervous and Mental Disease, Third Annual Meeting, 1922.]

Three years ago (1919) there was born in New York City a new child of medicine. It was a unique effort. It came from the youngest and most energetic of medical disciplines, neuropsychiatry. It was an association which was to be devoted to organized research, and each year it would outline a program for one, two or three years in advance, and then meet and present the results of such concentrated efforts upon one subject which seemed deserving of attack. This past Christmas week it terminated its third annual session of two days and was attended by at least 150 students of the problem presented.

The subject of its first year's efforts was Epidemic Encephalitis. Last year the topic of Multiple Sclerosis was presented, and this, its most successful meeting, was devoted to the results of two years' intensive work on Epilepsy and the Conclusion States, which subject will be made the object of further attack and be reported upon two or more years from now.

In his opening address, Dr. Walter Timme, who has been the continuous president and the most active of the original founders of this association, outlined the general features. He said:

Our third annual meeting brings us a step further along on the road we have chosen to travel, and as becomes seasoned travelers, we find that we need to discard many of the impedimenta which at first were thought necessary to our journey but which have since been proven to have merely bulk out of proportion to utility. As our society is pre-eminently one for research and not for the mere compilation of extant literature, even though this latter must of necessity be gathered in our bibliography, our programs must gradually be freed from all matter not truly savoring of original thought and work. The outlook seems therefore to be for less extensive but more intensive presentations; and so this year's offerings will be found to have, I believe, few of the characteristics of the ordinary symposiums on epilepsy. We do not feel that the entire subject must be covered in all of its aspects, but only in those on which more light or a greater approximation than heretofore to apparent truth may be had. The very first difficulty,—and there were many encountered—that confronted your program committee, was the choice of a comprehensive title for the subject before the society. The term epilepsy as it was commonly understood was immediately found to be inadequate, for while the convulsive seizure was uppermost in the mind as the concomitant of epilepsy and was the factor largely to be discussed at this year's meeting, yet it is trite to say that in the opinion of many some

epilepsies may have no convulsions at all in the ordinary acceptance of the term. On the other hand, many convulsive seizures that seem superficially to stimulate an epilepsy such as those occurring in uremia, diabetes, tetany and many of the other toxemias, may possibly not be truly epileptic. And so both terms, epilepsy and convulsion, had to be introduced into our title. It is not my function, thanks be, to differentiate or to define, but merely to point out the problem. You will find on our program, therefore, discussions on uremic and other toxic convulsive states and possibly even an attempt at a differential diagnosis between them and the epileptic. We shall also have exceedingly important, not to say interesting, reports of the production of convulsive attacks in animals simulating the epileptic attack, by various surgical and pharmacodynamic means. Immediately occurs the thought,—if surgical experimentation and pharmacodynamic assault release a mechanism in either case producing substantially the same manifestations, the approach to such a cortico motor release may possibly be along many other paths as well. Investigators are more or less in agreement that such motor release may be occasioned by various toxins, both endogenous and exogenous,—witness the eclamptic and uremic seizures, wormwood and strychnin poisoning; or by infection,—syphilitic, encephalitic; or through metallic poisons, lead and mercury;—or through a variety of other causes—all of which are to be separated from the anatomical causes produced by various forms and sequelae of traumatic insult, tumor, and other local irritative lesions in great number. And then, apart from these two great groups of causes of the convulsive state there is added the so-called group of idiopathic epilepsy or genuine epilepsy, with a convulsive manifestation which you will hear during these two days compared to the convulsive seizure of the two great pathological groups mentioned. Are the mechanisms released in the three types the same or do they differ in essential particulars as well as in their pathogenesis? To add to the complexity, some of us believe that instead of, or indeed in addition to, the motor release in genuine epilepsy there may be a pathological release in other domains and on other levels than the purely motor cortical. So that in the receptors of the special senses and other “gnostic” centers manifestations occur with attendant specific characteristics such as peculiarities of taste or smell or vision or hearing; or again with behavioristic and moral, intellectual and psychic and symbolic disturbances seen as the so-called *epileptic equivalents*—which term degrades them to a subsidiary position, and is only just as true as though we called the “fit” itself the motor equivalent of a disturbance on a higher level. Descending to the lower levels, are there not also disturbances in the basal ganglia, in the extended vagus system and even in the various segments of the cord leading to more or less circumscribed motor and sensory symptoms that are due to a release of some mechanism perhaps similar in its origin but different in its point of application? The motor

cortical release which by reason of its dramatic intrusion startles our senses into its acceptance as the "whole thing" has, by virtue of this self-advertisement for ages dominated our conception of genuine epilepsy. Is it for this reason that the comparatively smaller and less insistent gestures have escaped their true valuation? That is to say, is a muscular fibrillation, or a myoclonus or a subjective segmental transitory pain without any demonstrable lesion one of the forms of release produced in genuine epilepsy when the point of low threshold is a part of the spinal cord? It is possible that some of our theses will cover this point. As for the vegetative level, now that biochemistry is beginning to assume such magnificent proportions in our medical uncomfortableness, that is the line upon which—having failed in all others,—we are now concentrating our attacks. If the reason for a genuine epileptic seizure,—no matter upon what point it is centered,—is one of lowered threshold of the synaptic junction or other salient point of defense of the nervous system, then is such lowered threshold determined by a critical change in the biochemistry of the circulating fluids or else of the neural elements? Many observations of changes in the coagulation time of the blood, in the alkaline reserve, in the organic and inorganic retained salts and split protein products have come down to us as some of the underlying base-stones of the lowered threshold theory. As a corollary, what abnormal function of the glands of internal secretion could account possibly for such biochemical changes? One must have great optimism to face courageously these problems and to arrive at a comprehensive view of what we have termed genuine epilepsy. Your program to-day has upon its rolls some such intrepid souls, and we cannot sufficiently convey to them our appreciation of their contribution to our science.

As my function is largely to-day an inquisitive one, as you may have noticed, may I add to some of the simple questions thus far propounded, this: If the genuine epileptic attack,—no matter of what nature and focus—is due to a lowered threshold on the part of the neural elements or their structure, is such low threshold coefficient inherent in some constitutions apart from any biochemical, toxic, or other factor; so that certain individuals will respond with an attack psychic, intellectual, behavioristic, convulsive, vagal, or vegetative, or a combination of these more readily than others? If this is so, then are such individuals even without such attack (as we have been told by some observers that they are) different in their adaptability to their environment and to their problems? Is there an epileptic personality *per se* with not only no necessity through an attack for diagnosis, but actually without attack? Perhaps this part of our problem will be solved for us to-morrow.

From these more or less lucid questions and expressions, one thing, I believe, stands out prominently and that is, that to call a patient "epileptic" means almost nothing in an explanatory sense—it is merely calling him a name. If my questions were all answered affirmatively we

were all potential epileptics; and yet I doubt not, many of us would answer affirmatively and consider epilepsy an expression of a failure to overcome one of the difficulties that the race in reaching for higher and more specialized development encounters in its upward gradient. It would, in such a sense, be a hall-mark of the nonadaptability of the unfit in this drive for the ultimate.

I have already encroached too long a time on your patience and on our exercises, but something still remains to be said. If a tendency to a wider, more extensive application of the term epilepsy is apparent, it becomes increasingly our duty either to take the fear and sting from the term epilepsy—for its mere individual application is fraught with as acute perils as was the medieval term “heresy”; or else to invent a new name to cover the situation.

Apologetically, and in fear and trembling, may I venture to suggest that while the term epilepsy be retained to apply to all the symptoms complex that are at present thought to be due to what the term epilepsy connotes, namely, “a seizure upon” the individual through extraneous causes such as irritative lesions and drugs and toxins, yet that a new term connoting a seizure due to causes *within* and of the biological unit *per se*, be used to cover the inadequacies and deficiencies of the mechanism of the biological unit in its self-defense. Such a term might be “endolepsy.” Following the adoption of the complementary and to an extent the antithetic terms “epilepsy” and “endolepsy,” we would have at once a separation upon a more or less rational basis, of the many conditions heretofore known by the many hyphenated expressions that fill our discussions of the subject, into two great classes. It will tend to clarification, to definiteness of picture, to less diffuseness of argument and with a distinct end-product for our experiment and ratiocination to prove or disprove. [Author’s abstract.]

Elsberg, Charles A., and Stookey, Byron P. FIRST PAPER. CONVULSIONS EXPERIMENTALLY PRODUCED IN ANIMALS COMPARED WITH CONVULSIVE STATES IN MAN. A PRELIMINARY REPORT.¹ [Proc. Research Society, see preceding abstract.]

The results of the studies of this paper are based upon experiments with 261 cats. The methods used for the experiments were the injection into the femoral vein of essence of absinth (cultivée), and temporary clamping of the innominate and left subclavian arteries. This report, presented as a preliminary one, showed the following facts: (1) After one convulsion has been produced, the susceptibility of the brain is much reduced. For the production of a second convulsion the amount of the convulsive agent has to be much increased. In many instances it is impossible to cause a second convulsion no matter how large the “convulsing dose.” This increased resistance or diminished susceptibility is probably

¹ From the Clinics of the Neurological Institute and the Laboratory for Experimental Neurology of the College of Physicians and Surgeons, Columbia University, New York.

an exhaustion phenomenon and persists for one to three days, but disappears in less than ten days. (2) In thyroidectomized animals, the susceptibility to the first injection of absinth is greater than in normal animals, and the susceptibility to repeated injections is completely altered. Each injection of absinth caused a convulsion. (3) Diminished alkalinity of the blood does not render cats more susceptible to convulsions produced either by injections of absinth or by cerebral anemia. It is possible, therefore, that the diminished alkalinity of the blood so often found in man before and during an epileptic attack occurs as a result of or in association with the convulsive attack, rather than that it favors a convulsive attack. (4) Animals that have been starved for seventy-two hours are not less susceptible to absinth convulsions than those that have been fed shortly before the injections. The experiments, which are described in detail in the paper, represent the beginning of work to attempt to learn more of the nature of convulsive attacks. Results of experiments must always be applied with some reserve to conditions in the human being, for in man symptoms are a result of a diseased process, while in animals symptoms are produced by artificial means. The results of the experiments are, with this reservation, suggestive. [Author's abstract.]

Thom, D. A. EPILEPSY. [See previous abstract.]

The purpose of the research, a summary of which was presented at the last meeting of the Association of Research, held at Hotel Commodore, New York, on December 27 and 28, was to determine in so far as possible the relation between infantile convulsions and the chronic convulsive disorders of later life. Cases free from evidence of possible organic changes, brain anomalies such as hemorrhage, hydrocephalus, congenital syphilis, etc., were excepted from consideration, and also the acute cerebral conditions of which convulsions might be a manifestation, such as encephalitis, meningitis, were excluded. Thus we were left with that group of convulsive disorders associated with gastro-intestinal upsets, spasmophilia, rickets, acute infections, and a small group in which the convulsions occurred without any evidence of bodily disfunction.

In order to obtain material for this study, the records at the Massachusetts General, Children's and Infants' Hospitals were utilized. From 1,907 records studied, there were 246 having convulsions under four years of age. Of this number, 46 died in hospitals, leaving 178 to be located.

We were able to locate 109 of these individuals having had convulsions prior to the fourth year. These 109 cases fell in two distinct groups, those showing brain damage, those having either died from convulsions, or developed a chronic convulsive disorder which is still persisting, or who are at the present time considered mentally deficient without convulsions. The other group show no brain damage, and are considered normal. None of this group have had convulsions for at least seven and a half years. There is no indication of mental enfeeble-

ment, and those that are sufficiently along in years are considered socially and economically efficient. Sixty-two of the 109 cases belong to the brain damage group, and 47 belong to the group which we term without brain damage. It is interesting and quite significant in estimating the importance that should be attached to infantile convulsions, to note that 24 of the 42 cases having convulsions associated with gastro-intestinal upsets, in later life showed brain damage. It is also significant in estimating the consideration that should be given to infantile convulsions, to appreciate the fact that a very large percentage of all cases of epilepsy seen in our colonies caring for the chronic type of case, had their first convulsions during the first four years of life.

I feel that the pediatricians have failed to appreciate the real significance of convulsions associated with infancy, which is not surprising when one considers how limited their contacts with most of their cases really are, and further, that the neurologists and psychiatrists, in meeting the chronic convulsive disorders in later life, have failed to bring out the actual frequency of infantile convulsions in these cases. It would seem that much might be gained in our knowledge of convulsive phenomena if they could be studied by the neurologists in association with the pediatricians at a time when the whole mechanism has not been obscured by the repeated convulsive attacks themselves. [Author's abstract.]

Cobb, Stanley. CONVULSIVE STATES. [See preceding abstract.]

My report, I would like to explain, is a report of work now in progress, and is only worth reporting now so that we, who are doing experimental work, may in this way learn of each other's experiments and proceed along parallel rather than overlapping lines; so, if I may, I will start by speaking of those parts of my work which have overlapped either the work of Dr. Elsberg or Dr. Pollock. In the first place, we have worked with rabbits, using thujone, the active principle of absinth as the convulsant. In these rabbits we have been able to cause convulsive movements at all levels of the nerve axis. That is to say we have caused convulsive phenomena in decorticate, decerebrate and in spinal preparations. But in order to elicit the convulsions in these animals with reduced nervous systems we have to increase the dose to three or even six times the amount used on an intact animal. This corroborates Dr. Pollock, who tells us he obtained analogous results with picrotoxin. Part of our work has paralleled that of Dr. Elsberg on thyroidectomized animals. Rabbits with a known threshold dose for thujone were thyroidectomized. After a month or more we tried them out and found them as a rule, more susceptible to thujone than before the operation. We also tried the converse; thyroid feeding of rabbits. This appeared to make them less susceptible to these experimental convulsions. (See Arch. of Neur. & Psych., May, 1922, p. 660.)

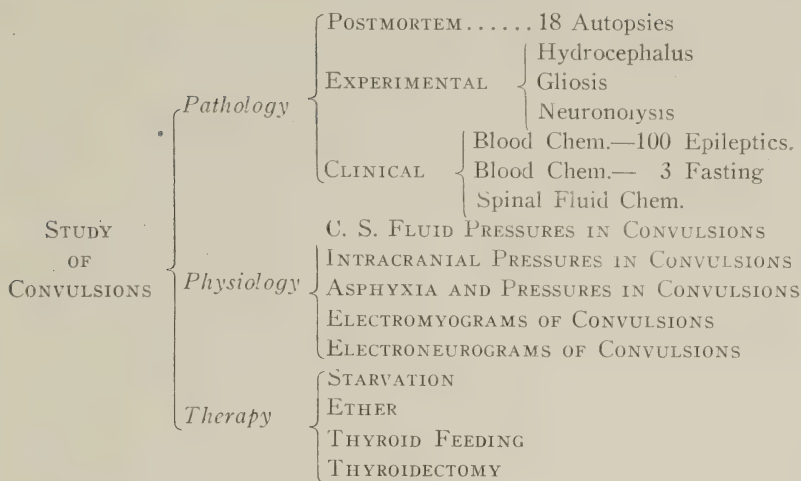


FIG. I.

(Slide): Our plan of attack on the problem of epilepsy is shown by this scheme. We started on postmortem examinations, and in these we have had no new experience. We have found the already described lesions of hydrocephalus, gliosis and nerve cell changes in almost all cases. Our idea is to try to learn which of these lesions are the result of the repeated convulsions, and which may be the cause of convulsions. Young rabbits were given repeated thujone convulsions, and showed a slight hydrocephalus after a few of these repeated attacks. (Lantern slide showing hydrops of the ventricles, contrasted with control from same litter.) We have as yet no gliosis nor nerve cell changes in these brains. This work on experimental hydrocephalus naturally led to an interest in cerebrospinal fluid pressure, because it is reasonable to suppose that this might rise during convulsions and dilate the brain ventricles. A few measurements of the cerebrospinal fluid pressure recorded by cistern puncture during experimental convulsions, have been made and we believe that there is usually a slight fall followed by a marked rise. (Lantern slide shown of charted manometer readings during convulsion.) I was interested in hearing Dr. Pollock speak of a period of apnea, because in our animals we also noticed such a period, and in another series of experiments with carbon monoxide we observed long periods of arrested respiration with a simultaneous conspicuous rise in intracranial venous pressure, but no rise of systemic venous or arterial pressure. (Slide—showing curves plotted from readings of manometers connected with the cisterna magna, torcula, brachial vein and femoral artery, also simultaneous observations of pulse and respiration rate.) These curves suggest that venous congestion is the main factor in causing the sudden rise of cerebrospinal fluid pressure in these experiments.

The starvation experiments on animals worked out well in one series.

of rabbits. We found these animals, after a week's fast, much less susceptible to the experimental convulsions (Arch. Neur. & Psych. loc. cit.), but I have been repeating those experiments and they are not now showing this result, so we will have to report on them later.

Another line of work is the recording of the action-currents of muscle and nerve during convulsions. (Slide—of the apparatus used for making the electromyograms and electroneurograms.) We put a pair of electrodes on the nerve, a pair of electrodes on the muscle. By a switch we can connect either pair with a string galvanometer, to register the action-currents, which are then recorded on a moving camera film. After the apparatus is in place thujone is intravenously injected and we make the electromyogram of the convulsion. (Slide—Electromyogram of an absinthe convulsion.) These are rapid action currents, at a frequency of rather more than 100 per sec.

Leading off the nerve, we get an electroneurograph with more frequent action-currents than the electromyograph. (Slide—A control made after pinching the nerve above the electrodes.) (Slide—shows no action-currents, *i.e.*, there are no nerve impulses running along the nerve.) (Author's abstract.)

Pollock, Lewis J. EXPERIMENTAL CONVULSIONS. A Consideration of the Epileptogenous Zones of the Central Nervous System. [Assoc. Research N. & M. Dis., 1922.]

In the present work it is proposed to determine whether an isolated segment of the brain stem could evoke convulsive seizures in the muscles innervated by this segment, in picrotoxin poisoning. Twenty-eight animals, eight cats and twenty dogs, were studied, and a large number of frogs were observed under certain conditions. Of the cats and dogs ten animals afforded successful experiments. Of these three were decerebrated by a transection of the brain stem below the optic thalami and four by transection immediately below the level of the nucleus of the seventh cranial nerve, and three were transected at two levels, one below the optic thalami and the other immediately above the level of the nucleus of the seventh cranial nerve. Of the latter group one received a hypodermatic injection of picrotoxin solution following the section in the pons above the seventh nerve. The other two received the injection following the double transection.

In two of the three animals with a section below the optic thalami convulsions differing in no discernible way from animals with intact central nervous systems were produced. The muscles of the face, jaw, and eyeballs participated in the convulsion. In the remaining animal the convulsions were tonic in character and followed by running movements. Convulsive movements occurred in the face, jaw and eyeballs as in the other two animals. It was observed that when a section was made at lower levels in the brain stem convulsions were produced with greater

difficulty requiring at times twice the amount, and occasionally even more than twice the amount, of picrotoxin solution. When they were produced their intensity was far less than those produced in animals having higher transections. Of the four animals transected immediately below the level of the nucleus of the seventh cranial nerve, in two generalized picrotoxin convulsion was produced. In one of these the muscles of the jaw, face and eyeballs participated in the convulsion. Of the three animals transected at two levels, the animal which received the hypodermatic injection of picrotoxin solution following the section immediately above the level of the seventh nerve, developed a typical picrotoxin convulsion with strong clonic contractions of the masseters and the muscles of the eyeballs. When this animal's brain stem was transected again below the level of the optic thalami the convulsions became less pronounced but retained clonic and tonic features but the movements of the jaw and eyeballs ceased. The remaining two animals did not develop any convulsion after the double transection.

From these animals it may be observed that picrotoxin convulsions may be produced after transection of the brain stem either below the optic thalami or above or below the level of the seventh cranial nerve and that these convulsions retain their clonic features. Whether the animal is transected at one or the other level some muscles of the head and eyeballs participate in the convulsion. In other words, whether the segment innervating the muscles of the face, jaw and eyeballs was connected with the medulla alone or the cerebrum alone, convulsive disorders occurred in these muscles. It would seem probable, although not absolutely proven, that this observation indicates the epileptogenous quality of the motor cells in the reticular formation extending from below the optic thalami to the spinal cord.

Conclusions: From these experiments no conclusive evidence could be adduced that an isolated segment of the brain stem contained epileptogenous elements.

It appeared highly probable, however, that such was the case.

It would seem that epileptogenous qualities are possessed by the ganglion cells of the brain and the brain stem alike.

That convulsive movements may be evoked by proper stimulation of such cells at any level and that the first symptom produced depends upon the level so stimulated. [Author's abstract.]

Langeron, L. ACUTE EDEMA OF THE LUNG IN EPILEPSY. [Presse méd., V, 65.]

From a study of the association of edema of the lung with epileptic attacks, it is concluded that this complication is to be regarded as due to an extension of the cortical motor disturbance to the medulla: the intense vasodilatation and edema of the lung are thus taken to represent disturbance of the sympathetic and to bear an analogy to other manifestations such as migraine, angina, diarrhea, and vasomotor disturbances of the

skin, sometimes concurrent with epileptic fits. The prognosis in epilepsy is made much worse by this complication. The patient, a woman aged forty-two, had been married twice and showed signs of syphilis. In early life she suffered from chorea and one attack of rheumatism which left no trace of cardiac affection. At twenty she had a febrile attack which may have been typhoid fever, after which the chorea ceased, but was followed every month by vague nervous symptoms. After an attack of mumps, two years ago, she developed regular epileptic fits; after the fit she became very cyanosed, intensely dyspneic, and brought up quantities of frothy blood-stained sputum, while râles were heard throughout the chest. Relief followed copious bleeding. A similar attack of edema was noted after another epileptic fit. Cases of true pulmonary edema are rare—the author has only been able to collect seventeen (ten women, seven men), of whom nine died. With one exception there was no cardiac or renal affection; in another case the thymus was enlarged. After discussing the pathogeny he suggests that his case was a visceral epilepsy comparable with migraine, angina, or sweating, and due to a spread of the irritation in the motor cortex to the bulbomedullary areas.

Asal and Moro. MALIGNANT NODDING SPASMS IN INFANTS. [Jahr. f. Kinderh., Sept., 1924. J. A. M. A.]

Asal and Moro call attention to a malignant type of nodding spasm, occurring in early infancy, which should be differentiated from the salaam spasm. The clinical features are a sudden jerk passing through the body as from an electric shock. The head falls forward, and the arms are flung outward or backward. Seventy such attacks were noted during twelve hours in one case. This "lightning spasm" is always single, while the salaam spasm appears in series. Both these kinds of spasm are due to organic changes, of epileptic nature, but with a special localization in the central nervous system, and the outlook for the mental development of the child is unfavorable. Asal and Moro emphasize further that the salaam convulsion is currently confounded with nodding spasm, which is a benign disturbance. The latter, on the other hand, should be distinguished from head jactation, nocturnal or diurnal, automatic movements which are a matter of habit, and have nothing in common with convulsions.

Read, C. Stanford. PATHOGENESIS OF EPILEPSY. [Br. Jl. Psychol., Med. Sect., Vol. I, No. 1.]

This is a sympathetic review of the work of L. Pierce Clark upon epilepsy so well known to American readers. Thirteen papers are referred to.

Robertson, A. W. CHRONIC INTESTINAL STASIS AND EPILEPSY. [Brit. Med. Jl., Dec. 27, 1924.]

This paper dwells upon the importance of chronic intestinal stasis as a factor in the pathogenesis of epilepsy, but says nothing about the whys and wherefores of the stasis itself. Twenty-seven cases are studied, all

for indications or history of chronic toxic conditions which naturally on prevailing medical dogmas would not be difficult to substantiate. The blood, menstrual blood, urine, and stools were examined, and the condition of the uterus, urinary bladder, teeth, tonsils, nares, and sinuses investigated. Thirteen cases were roentgenographed with bismuth meal and barium enema, and eight of these were operated on for conditions of advanced stasis affecting the general health. In every epileptic examined the clinical and laboratory evidence was eloquent of considerable chronic intestinal stasis and widespread mucosal catarrh of the intestine. Treatment has been primarily directed in every case to the relief of the intestinal condition, but the author neglects the factor of his own interest and personality in the therapy.

Behrendt, W. SENSORY JACKSONIAN EPILEPSY. [Med. Klinik, Feb. 20, 1925.]

Behrendt's patient had attacks of sensory jacksonian epilepsy after a fall from a horse. The cerebrospinal fluid was yellow, but otherwise normal. The boy recovered in about eight weeks. The attacks were probably due to a serous meningitis.

Worster-Drought, C. NARCOLEPSY. [Br. J. Med. Psychol., Vol. III, Pt. 4.]

An excellent historical résumé of his by no means infrequent syndrome with recognition of the general level hypothesis of Jackson as later made more explicit in Jelliffe and White's "Diseases of the Nervous System." He advocates modified psychoanalytic treatment as well as revival of memories under hypnosis. No analyses given.

Hoeffel, G., and Moriarty, M. THE EFFECT OF FASTING ON THE METABOLISM OF EPILEPTIC CHILDREN. [Am. J. Dis. Child., XXVIII, 16.]

The authors took advantage of an opportunity to study the blood components, the urine chemistry, and the effect of shifts in the alkali reserve on the hydrogen-ion concentration of the blood in two epileptics who were undergoing a course of fasting as a therapeutic measure.

The clinical histories of the two patients would indicate that they were typical epileptics. They were kept in bed and from 65 to 100 ounces of water was given daily.

Tables are given, and a study of them shows that there was strikingly little variation in the blood creatinine, nonprotein nitrogen, and amino-acid content. The blood uric acid, however, was definitely increased during the fasting and maintained at a high level until the fasting was ended. The increase was 100 per cent. The blood-sugar, on the other hand, was greatly reduced, being maintained throughout the fast at 45 m.m. per c.c. of blood.

During the fasting period these children showed no convulsive seizures and their general condition improved markedly. The urine showed an increased excretion of ammonia and its titratable acidity was increased.

The hydrogen-ion concentration of the urine was increased and acetone bodies were found present. These figures are similar to those found during other fasts and were due probably to an existing ketosis being present.

Attention was directed toward the reaction of the blood because of the association of acidosis with many of the procedures having a favorable influence on epilepsy. Symptoms ascribed to acidosis frequently accompany ether anaesthesia, acute infections, and various other conditions during and after which epileptic convulsions in some instances subside. A few patients in hospital seemed to show that when sugar was given at the time of the fasting and the acidosis prevented there was less improvement than when the acidosis was allowed to develop.

Clinically the convulsive symptoms disappeared shortly after the point of greatest acidosis was reached. This was maintained in one patient for four weeks, and in the other patient the convulsions did not cease but were materially lessened for three months.

Peterman, M. G. THE KETOGENIC DIET IN THE TREATMENT OF EPILEPSY: A PRELIMINARY REPORT. [Am. Jl. Dis. Children, Vol. XXVIII, p. 29.]

Three years ago, Wilder proposed the use of ketogenic diets in the treatment of epilepsy. His interest in the subject was aroused by the favorable results of prolonged fasting, reported by Geyelin. One of the metabolic irregularities accompanying fasting is the accumulation and excretion of aceto-acetic acids and its products, beta-hydroxybutyric acid and acetone. A similar ketosis occurs in diabetes when the oxidation of sugar is sufficiently depressed, and may be provoked in nondiabetic conditions by diets in which the proportion of carbohydrate and protein is sufficiently restricted. Wilder suggested that such diets might offer a method of treatment for epilepsy which would equal or surpass fasting in effectiveness, and prove to be more practical because it could be continued for longer periods. It is not practical to attempt to accomplish a ketosis by feeding or injecting aceto-acetic acid, because the organism easily converts this substance into nontoxic materials. Wilder showed, for instance, that in normal dogs, when adequate carbohydrate metabolism was under way, injected aceto-acetic acid was promptly and totally converted into beta-hydrobutyric acid. Therefore, the only practical method of securing a sufficient accumulation of aceto-acetic acid in the nondiabetic body is to restrict carbohydrate metabolism either by starvation or by a diet containing a minimal amount of carbohydrate. The work of Zeller, Ladd, and Palmer, Shaffer, and others has made it possible to plan diets that will be ketogenic, and Wilder has proposed the following scheme for the diet of epileptic patients.

Protein may be converted in large part into glucose; therefore, the protein allowance must not exceed 1 gm. for each kilogram of body weight. In adults 0.67 gm. is adequate.

The total calories should not exceed the actual metabolic requirements of the patient. This requirement may be calculated with sufficient accuracy by increasing the basal metabolic requirement from 30 to 50 per cent. The basal metabolism may be determined directly, or it may be calculated from the Du Bois normal standards. When the total calorie of the diet and the protein allowance are known, the following formulas give the fat and carbohydrates:

$$\begin{aligned} F &= 0.101 M - 0.216 P \\ C &= 0.244 M - 2.27 F - P \end{aligned}$$

In practice this amounts to feeding not more than 15 gm. of carbohydrate, and in some cases less than 10 gm. of carbohydrate daily, with not more than 1 gm. of protein for each kilogram of body weight, and enough fat to make up the required calories.

These diets should not be started abruptly, or they may not be tolerated. After a few days on less rigid carbohydrate restriction, however, they can be instituted without harm, if due attention is paid to vitamins and salts in planning menus. Frank, and Osborn and Mendel have done some important work in this connection. They reared young rats to normal maturity on diets consisting almost exclusively of fat and protein.

Of seventeen patients treated with a ketogenic diet, ten are entirely free from convulsions, nine having had no other treatment. Four patients have shown remarkable improvement in that the convulsions, formerly two to two hundred a day, have been reduced to one every two weeks in two instances, and to three to four a day in the other two. Two patients have not been heard from.

For comparison, the results of other types of treatment are cited. Forty-three patients received the routine treatment for epilepsy, which consists in: (1) removal of all foci of infection, (2) enforcement of a definite regime in the daily life, (3) correction of errors of refraction, and (4) luminal and sodium bromid as indicated. No distinction is made, so far as treatment is concerned, between idiopathic and symptomatic epilepsy except in definitely focal convulsions following injury. Fifteen of these patients (ten with grand mal, two with petit mal, and three with grand and petit mal) have been free from attacks for from six months to three years. Seven (three with grand mal, two with petit mal, and two with grand and petit mal) are greatly improved, and have only occasional attacks. Eleven patients have not responded to treatment. Ten were not heard from. Three patients, one with grand, one with petit mal, and one with both, responded to anticonstipation diets and purging only, with no further attacks. Six patients, five with grand mal, and one with petit mal, did not respond to this treatment. Five patients are being treated by other physicians with various results. Nine patients, on various forms of treatment, were not heard from. [Author's abstract.]

BOOK REVIEWS

Wilson, R. M. PYGMALION OR THE DOCTOR OF THE FUTURE.
[E. P. Dutton and Company, New York.]

In the to-day and to-morrow series a number of small yet fascinating essays have been published, *Dædalus* by Haldane and *Icarus* by Russell leading the phalanx. Not many of the followers quite come up to these leaders, the pace having been set at top speed as it were. The present essay is quite popular, entertaining, but hardly gets to grips with the subject. Factually speaking we doubt if any short essay could do it—or do more than this one.

Ceni, Carlo. PSICHE E VITA ORGANICA. L'ATTIVITA PSICO-NEURO-ENDOCRINA. [Soc. Anonyma Istituto Editoriale Scientifico, Milano, pp. 250, Lira 65.]

Readers of this magazine who have followed with some slight degree of interest its purposes in presenting the manifold appearances in this field may recall that the author has already made an extremely interesting and valuable contribution (1922) upon the brain and its relationships to the maternal functions. This study is but one of many of fundamental importance in the unraveling of the intricate correlations of structure and function.

The present monograph of some 200 pages and more advances still further into the speculative fields of this type of correlation. As the clinical director of the Cagliari Psychiatric Institute, the writer in his present contribution would summarize his latest investigations in this domain, the result of years of research on his own part and that of his school.

His investigations have been of two sorts, but based upon the same principle: that psychical phenomena are elaborated in the brain from material derived through the senses. Through the one form of observation, he sought to establish the correspondence between the brain and the organic functions, with especial attention given to sexual phenomena in connection with brain activity; through the other, to investigate the same relationship from the point of view of suppression and repression. The constant agreement of the results of these experiments proves the very great inhibitory power which the brain, activated by sensory stimuli, exercises upon the inherited biological processes of either sex.

There is furnished thus a basis for the evaluation of normal differences of various character in the conditions of the brain, for from these depends the mode of reaction of the peripheral organs. This conception finds its greatest significance in the field of the pathology of mental diseases, inasmuch as it lays emphasis here

upon the moral phenomena as results rather than as causes of mental disorder.

For this reason, the book has great value also for criminology, where sexual and other cases must be judged with due consideration given to psychical and physical factors together. The work is scientifically important, further, for biology and general medical knowledge.

Dodds, E. C., and Dickens, F. *THE CHEMICAL AND PHYSIOLOGICAL PROPERTIES OF THE INTERNAL SECRETIONS.* [Oxford University Press, New York, London, etc.]

In this very valuable work there is an attempt to portray the chemical nature of the hormones and also a discussion of the physiological activity of certain of these.

They open with a discussion of insulin, then continue in the next chapter with tethelin, pituitrin, hypophysine of the pituitary body. Iodothyrene, iodothyreoglobulin and thyroxin are next taken up. The ovarian secretions, not yet isolatable, adrenalin and a final miscellany deals with secretin, parathyroid possibilities and lastly spermin.

This is indeed one of the most excellent pieces of work in the endocrinological line.

Silfoerskiöld, Nils. *ORTHOPÄDISCHE STUDIE UEBER HEMIPLEGIA SPASTICA INFANTILIS.* [Acta Chirurgica Scandinavia, Supplementum V, Stockholm.]

Attention is called to this noteworthy thesis of some 250 pages in which a full consideration of the clinical situation and the therapy may be found. The author believes that only the tendo-muscular lengthenings and resections of motor nerves have stood the test of time. The monograph deserves a wide reading.

Stekel, Wilhelm. *SADISMUS UND MASOCHISMUS.* [Urban und Schwarzenburg, Berlin u. Wien, Mk. 24.]

In twenty chapters this book of 800 pages, constituting Vol. VIII of Stekel's Studies on the parathies as he chooses to call the neuroses and psychoneuroses, gives a series of discussions with illustrative cases bearing chiefly upon the minor and major aspects of sadism and masochism.

As a matter of fact Stekel deals here very little with the cruder psychopathia sexualis forms of sadism or masochism, such as have been classic in the works of Krafft-Ebing, Moll, Havelock Ellis, etc. He discusses rather the finer ramifications of the sadistic and masochistic trends which are found in all human beings. Often these appear in the most hidden and bipolar types of manifestations, such as the typical examples to be found of strongly sadistic repressions in "anticruelty" reformers of various shades. The sadistic religionists of the casting out devil, fire and brimstone varieties, these are also classical.

Interesting chapters of concealed hates may be read in the unconscious of many melancholias who would not dare to hurt a fly, so

overcompensated are their desires to kill and of which the sense of guilt affords partial evidence.

Stekel most penetratingly illumines the ambivalent—bipolar he prefers to call it—qualities of sadomasochism as revealed in the homosexual setting. The failure of the Adlerian viewpoint to in any way formulate the male who would play the female rôle on the basis of the “male protest” aspect of his general theory is brought out. Sodomy and Sadism makes an interesting chapter as does also the chapter on Sympathy.

Freud's interesting thesis concerning “*ein kind wird geschlagen*” is taken up in detail and illustrative material added.

Cannibalism, Necrophily and Vampirism take up a chapter which is filled with stimulating material and Stekel's handling of the epileptic symptom complex is full of suggestive ideas.

When the many conflicting aspects of the psychoanalytic movement are viewed from afar, Stekel's figure will certainly appear in the whole plan as one whose clinical contributions along sound observational lines cannot be overlooked. His descriptive skill is unquestioned and his freshness and vigor are stimulating. Even should he leave for others the more subtle problems of metapsychology in the complicated dynamics of human behavior, and with which he at times seems impatient, it can be said that Stekel has much to offer clinically and therapeutically.

If it be said he must be read critically, this can be said of all works in psychopathology as it is now developing. One has only to read Rank and Ferenczi's very interesting recent summary of the development of psychoanalysis [Monograph Series No. 40] to realize the great strides which this branch of study has taken since Freud gave it such a powerful new series of conceptions with which to work. Most physicians stand towards psychotherapy hardly out of the Hippocratic dark ages. Their ideas are as confused as those of Galen when facing an hysterical conversion, or an anxiety depressed state. All they can think of is analogous to Galen's humors, *i.e.*, autointoxication. This rubbish is difficult to clear away. Stekel's volumes are needed to help clean the Augean stables of accumulated superstitions and superficial thinking in medicine, and as real contributions to the clinical delineation of those behavior disorders frequently spoken of as neuroses and psychoses, they stand out in bold relief in the skyline of present day psychopathology.

Pappenheim, Martin. LUMBAR PUNCTURE. [Translated by Georges Caffrey, William Wood & Co., New York.]

The original German edition of this work on the cerebrospinal fluid and upon the therapeutic indications and uses of lumbar puncture was immediately recognized as of paramount value in this rapidly developing aspect of medicine.

We therefore welcome its translation and trust it will find as widespread a reception here as it has found in the land of its birth. The translation is most excellent.

Urstein, Maurice. LEOPOLD AND LOEB. A PSYCHIATRIC PSYCHOLOGICAL STUDY. [Chicago Medical Book Company, Chicago.]

After 46 pages devoted to a cursory review of the catatonia problem the author gives a newspaper pot pourri of the details of this important medico-legal case. He concludes that both of the patients had catatonia.

Mathieu, Pierre. SYNDROMES NEUROANEMIQUES. [Gaston Doin et Cie, Editeurs, Paris, 20 f.]

The author points out that the well known neurological syndrome of spinal cord degenerations following pernicious and other types of anemia has had but little work done upon it by French observers. This he believes is not due altogether to the absence of the syndrome but rather he thinks it has been overlooked.

He would make good this lack and we congratulate him upon this most excellent monograph of 172 pages with 20 illustrations and one plate.

The pathological investigations are quite minute and careful. Furthermore the study has value in that Mathieu has included in his consideration related syndromes of cachexias, infections, pellagra, lathyrism and also certain situations which follow persistent digestive disturbances.

MacLeod, Alexander B. MENTAL HYGIENE AS TAUGHT BY JESUS. [The Macmillan Company, New York, \$1.50.]

The author is a pastor in the Congregational Church of Poughkeepsie and like many another reader of the Bible has been impressed with the intuitively arrived at and instinctively guided wisdom particularly of Jesus, as bearing upon present day attitudes which are called mental hygiene.

Stanley Hall's masterly work *Jesus Christ in the Light of Psychology* has shown what eminently sound feeling aspects Jesus had towards the most important of psychological principles and the present work emphasizes anew and most interestingly this geniuslike quality of this great teacher.

Here is a very human document, delightfully written and full of good common sense in its mode of presentation.

Kretschmer, Ernst. MEDIZINISCHE PSYCHOLOGIE. [Georg Thieme, Leipzig.]

We welcomed the first edition of this work as offering a great advance from the academic psychologies which with but few exceptions showed no touch with reality as physicians met it at any rate in their contact with human beings struggling more or less successfully with their environment, but not without envies and hatreds and piques, tempers and sorrows, not to speak of those greater swings of behavior variation which could then be labeled as psychoneuroses or psychoses.

In his second and third editions the author has improved his

initial text and the present volume is to be most heartily welcomed. Those who have lost their contacts with the schoolroom psychologies and yet are not ready to swing into the Freudian column will find Kretschmer an excellent halfway trail.

Guillain, Georges, and Mathieu, P. *LA SALPÊTRIÈRE.* [Masson et Cie., Paris.]

The hundreth anniversary of the birth of Charcot has given occasion for many reminiscences of his personality, his work and his locale, the Salpêtrière, one of the most delightful of which is this small volume before us. Professor Guillain, the present day successor to the chair, and his colleague have given an attractive illustrated recital of the old hospital dating back into the sixteenth century. Three hundred years of medical history are here most fascinatingly presented.

To the neurologist and psychiatrist the Salpêtrière has throughout the past two hundred years stood out as a monument of their interest and as a mecca towards which they have looked for study and for enlightenment.

One can here follow the history of this now enormous city from its first inception as a "home for poor beggars" which were regarded in those pious days as "living members of Jesus" and not as useless members of the state. Many tragic days and exciting events have been seen here. Manon and Madame de Valois were imprisoned here. The St. Medard convulsionnaires were interred by order of the king and during the reign of terror the prisoners in the lockup here were brutally massacred. Here Pinel and later Esquirol taught the new psychiatry and finally Charcot's genius gave it an eminence and luster which it has retained to the present day.

Living and moving pen portraits of the successors of Charcot, Raymond, Dejerine and Marie are also to be found in this most attractive brochure. Students of the history of neurology should know and treasure this charming offering of a grateful pupil and successor to the high honor of preferment as present holder of the professorship of neurology in the Salpêtrière clinic.

Campbell, C. Macfie. *A PRESENT DAY CONCEPTION OF MENTAL DISORDERS.* [Harvard University Press, Cambridge.]

A short Harvard health talk to a lay audience which deserves high praise. It is solid common sense, attractively and humanly told and is as scientific as it is understandable. Such a talk should be reprinted by the thousands and scattered throughout the entire United States.

Sadger, J. *AUS DEM LIEBESLEBEN NICOLAUS LENAUS.* Vol. VI. *Schriften zur angewandten Seelenkunde.* Ed. by S. Freud. [Franz Deuticke, Wien u. Leipzig.]

Sadger here contributes some new material to his discussion of the love life of this poet and especially makes use of newer psycho-

analytic advances in his analysis of this special behavioristic manifestation.

To all those interested in the production of artistic forms of expression this study will appeal.

Pfister, Oskar. DIE FROMMIGKEIT DES GRAFEN LUDWIG VON ZINZENDORF. Zweite verbesserte Auflage. [Franz Deuticke, Leipzig u. Wien.]

This psychoanalytic study of pathological piety, already noted in these columns on its first appearance, is a definite and valuable contribution to religious behavior.

Very religious people are usually very sick people, the psychological roots of their illness are here well illustrated and we can commend this study to all students of behavior. This is one of Freud's series—*Schriften zur angewandten Seelenkunde*, Vol. VIII.

Brown, Wm. PSYCHOLOGY AND THE SCIENCES. [A. and C. Black, Ltd.]

This is a small volume made up of eight most interestingly written essays bearing upon the relationships of psychology to biology by Haldane, to anthropology by Marett, to logic by F. C. S. Schiller, to ethics by Jacks, to theology by Rawlinson, to education by Keatinge, to medicine by Brown and to psychical research by Mitchell. Each essay is attractively written. Schiller's on psychology and logic has impressed us the most but they are all entertaining. Brown's chapter on psychology and medicine suffers from a wobbly understanding of what is meant by "determinism," a sublime naïveté as to what people call "normal," a wholesale use of psychoanalytic conceptions and then an amusing rejection of the source from which they come. Mitchell's short chapter is quite readable. Apart from the necessary superficiality of these lectures given at Oxford in 1923, the little book has a mission.

Aichhorn, August. VERWAHRLOSTE JUGEND. WITH AN INTRODUCTION BY PROF. SIG. FREUD. [Int. Psychoanalytic Verlag, Vienna.]

This series of ten lectures is the precipitate of several years of almost dramatic experience in the handling of delinquent children along with theoretical assessments on the basis of psychoanalysis. Aichhorn is attached to the Vienna child welfare department and director of a state asylum for delinquent children and minors. Although corrective training from modern points of view has been introduced in Vienna largely since Austria became a republic, even most experienced American workers will be interested to learn how successfully psychoanalytic principles turn out in corrective practice.

The earlier chapters on *Some Causes of Delinquency* are classic in their field and a great credit to the accomplishments of analytic science. Aichhorn begins by distinguishing clearly between the sources and symptoms of delinquency, between the latent and the overt asocial condition. The symptom is, as the word implies, but a lead to a deeper disturbance; and, just as analysis otherwise

is not symptomatically directed, so does he warn against those older methods which sought their success in the dispersal (more accurately the suppression) of the overt act. On the basis of actual and extensively arranged cases he elucidates the importance of the psychic constellations shown by psychoanalysis to be as basic in the life of the healthy as in that of the neurotic. Formally the delinquent may be considered a neurotic and the symptom an equivalent of the neurotic symptom. The edipus complex, the mechanisms of identification, feeling of blame, aggressiveness take on newer and more pregnant meaning as they are shown to form the ceaseless spring from which the delinquent acts must flow. Psychoanalysis has shown us how truly the home is the institution which prepares the individual psychically for society. Aichhorn presents extensive evidence for the fact that unnatural ties in the family are highly calculated to make the child latently asocial until, under an otherwise slight condition, he passes to overt delinquency.

For the child the love born to the father or received from him is socially definitive. For the female corrective agent the rôle of the mother takes on relative importance. Since the home and, more particularly, unnatural ties toward the father are at the bottom of delinquency, the psychoanalytically oriented educator will strive to fill the position of father as completely as possible. The analytic transference must be effected from which the mechanism of identification, which "does the trick," follows. The tangibility of this situation can hardly be more admirably demonstrated than by the case brought in illustration of it. That the home and its ties has often been recognized as the seat of delinquency is true, but it loses all its moral odor here and achieves a bit of salutary psychologic formulation. That educators of merit have always been in the position of father or mother to their charges but corroborates the logical principles which are here introduced to insure the competent of practical accuracy.

In several smaller ways it is shown how these strictly theoretical considerations can often bring about a transference and even effect educative gains once the position is obtained. But the most imposing vindication of the conclusions are to be found in the records of the Oberhollabrunn asylum, particularly the records pertaining to the socialization of a "dirty dozen" of aggressive incorrigibles who did not fit into any of the corrective groups already arranged there. On the basis of planned action and without changing the otherwise prevalent rule of absolute freedom, much activity, the same food at the same time for guardians and charges alike, Aichhorn, with two women and the dozen moved into a separate shack. The noise of rowdiness could be heard for blocks. After several weeks the two women had to be replaced because of exhaustion and another barrack occupied because of wreckage of the first. To keep strictly aloof under such riotous conditions is an almost superhuman task, but it began to deliver results when days with absolutely no loud tone were recorded. The transference had been effected and results in the

form of sociability and increasingly better school grades began to appear.

The book closes with chapters on the importance of the principles of reality and the ideal ego in social conduct. The publication in lecture form detracts materially from the otherwise closely knit presentation of some chapters. The book is nevertheless a fine addition to the International Psychoanalytic Library.

SAM PARKER.

Abraham, Karl. PSYCHOANALYTISCHE STUDIEN ZUR CHARAKTER-BILDUNG. [Internationaler Psychoanalytischer Verlag, Leipzig, Wien, Zurich.]

This Vol. XVI of the Int. Psa. Library consists of a reprint of three of Abraham's most interesting and valuable contributions to character formation, Contributions to the Theory of Anal Character, Oral Eroticism in Character Formation, Character Formation and the Genital Developmental Stages.

It is a common place to say that the acorn contains in principle all that which will develop into an oak and so in the child the beginnings of all possibilities of character development are present. Just which trends will come more into prominence than others the so-called behaviorist may some day be able to tell us, but certainly analytic study has abundantly shown just why certain evolutions have taken place for the stages of their evolution can be followed backwards almost to their very roots. This is the great advantage of the analytic method properly comprehended.

Abraham's work has been full of value and these three papers are of supreme importance to the student of character formation which is becoming of as much importance in psychoanalytic investigation as were once the problems of the neuroses and psychoneuroses.

One can hope these studies may be adequately translated.

Crouzon, O. MALADIES FAMILIALES DU SYSTÈME NERVEUX. [A. Maloine & Fils, Paris.]

Just a line to say that this excellent chapter from the Sergent, Dumas, Babonneux *Traité* is available in reprint form.

de Fleury, Maurice. L'ANGOISSE HUMAINE. Avec une l'introduction touchant le renouveau de la Psychologie. [Les Editions de France, Paris.]

There is no single situation in human behavior that is as subtle as "anxiety" and chiefly because of its complexity. We are speaking chiefly from the frame of neuropsychiatry. The affective life, or formerly more spoken of as the emotional life, contains within it the thing which for lack of a better term has been called "soul." Of the manifestations of disturbance in the "soul" anxiety is one of the most widespread and important.

Dr. de Fleury has here contributed an excellent discussion in the most typical and classical French manner and idiom.

He is thoroughly en rapport with his French studies and gives an

excellent perspective of the attack made by French psychiatry upon the ramparts, but we feel he never has even passed the moat. As for entering into the stronghold of the dynamics of the affective life, we regret to state that we do not find him at all aware of most of the important problems, to the better understanding of which psychoanalytic investigation has contributed so much.

The book is charming, it has great literary merit, but little real insight into dynamic psychology. De Fleury is another of those gratuitous prophets, who have consigned Freud's ideas to oblivion, just at a time it may be noted when they are beginning to be understood in France and giving an impetus to psychiatry which slumbering French psychiatry has been so much in need of.

Freud, Sigm. KLEINE BEITRÄGE ZUR TRAUMLEHRE. [Internationaler Psychoanalytischer Verlag, Wien.]

These delightful contributions to the study of dreams which appeared for the most part in the periodical literature and in the *Zwänglosen Heften* are here available in this small monograph of 76 pages. It contains, *Fairy Tale Material in Dreams*, *A Dream as Means of Proof*, *Dream and Telepathy*, *Notes Upon the Theory and Practice of Dream Interpretation*, *The Limits of Dream Interpretation*, *The Ethical Responsibility for the Contents of Dreams*, and *the Occult Significance of Dreams*.

The ingenuity, penetration and openness of Freud's mind is most strikingly shown in these short contributions to the study of dreams.

A few are available in English in the Hogarth Press collection of Freud's works, Vols. II and IV, and they are all available in the collected works in German. A few are new.

Kallen, Horace M. CULTURE AND DEMOCRACY IN THE UNITED STATES. [Boni and Liveright, New York.]

Our memory fails us but we half surmise that the classical reference is to de Toqueville, or something like this, who warned the literati that such big groups as nations could not be characterized by a few catch phrases as to their salient behaviorisms. Hence, we approach any work of this kind efforting to give a mass psychological study some definite formulations with reserve.

We are somewhat disarmed when the author speaks of "studies" and of "peoples," and as we read are quite charmed with the breadth of view and also the perspicacity displayed. He is willing to call it a series of reflections and as such it is entitled to a respectful hearing. On the whole we believe from our little survey of life in the United States the book is well worth reading and that it contains much sound observation and good sense.

Fishbein, Morris. THE MEDICAL FOLLIES. [Boni and Liveright, New York.]

No one should be without this book. Not because it knocks things that as physicians we know need it, but for the good sense displayed in the way the author has been able to do it.

This kind of tonic is needed for much sloppy thinking. It will not prevent it; the causes lie too deep, but it will prove salutary for hosts upon the borderline.

In the long run the lunatic fringe, which by the way can hardly be called a fringe, will destroy itself because of its faulty adaptation to reality, but in the meantime works so entertaining and well written as this offer much stimulus and satisfaction.

Rademaker, G. G. J. DIE BEDEUTUNG DER ROTEN KERNE UND DES UEBRIGEN MITTELHIRNS FÜR MUSKELTONUS, KOERPERSTELLUNG UND LABYRINTHREFLEXE. [Das deutschen Uebertragen von E. Le Blanc, Julius Springer, Berlin.]

We have had occasion to review this splendid monograph of Rademaker's as it appeared. Now that it is available in German rather than in the impossible Dutch language its great merits are all the more ascertainable. Furthermore it should be noted that some additional experimental work has been performed upon the substantia nigra.

The work of v. Monakow, Magnus and Kleijn, of Winkler and of Sherrington and of their pupils have given to the neurological world an entirely new series of important insights into the complex mechanisms of the body's accommodation to gravity and to inertia. In this galaxy of brilliant lights this piece of work stands out as one of the first magnitude. No review could hope to abstract its findings and we shall not try it here, but simply state that the material offered is fundamental for any one who would pretend to know anything definite about the reflex activities of the vertebrate animal as influenced by the presence, absence or modification of the red nucleus, midbrain and contiguous structures.

Hanson, Adolph M. PRACTICAL HELPS IN THE STUDY AND TREATMENT OF HEAD INJURIES. [Richard G. Badger, Boston.]

This small and practical manual deals more particularly with the head injuries of war conditions rather than with those more frequently encountered in civil injury possibly with the exception of the short chapter upon fracture of the skull.

The symptomatology is largely neglected for general surgical considerations and these are but fragments.

OBITUARY

HENRY M. THOMAS, M.D.

1861-1925

The age of neurological institutes with wards, laboratories, technical equipments, salaried staffs and endowments is arriving and is welcome. But some of the greatest work in clinical neurology has been done in bare out-patient rooms with a meager outfit—a camel's hair brush or a wisp of cotton, a pin, a couple of test tubes, a vibrating fork, a percussion-hammer, an ophthalmoscope, and a small electrical apparatus. When it is recalled what a Charcot, a Marie, an Oppenheim, a Hughlings Jackson, a Gowers, or a Weir Mitchell could do neurologically with simple furnishings, it is realized that it is the mind of the worker that is all important—institutes and equipments are merely accessory and contributory.

The first clinical professor of neurology at the Johns Hopkins Hospital and Medical School, Dr. Henry M. Thomas, did his work during thirty years in a few small rooms in the dispensary of the hospital. Much as he would have enjoyed the direction of a neurological institute, immersed in modern facilities for research and surrounded by a group of eager assistants and investigators who looked to him for leadership, the lack of these did not deter him from making the most of what was available. He showed how thoroughly out-patient material could be clinically studied, how well neurology could be taught to medical students, and how successfully knowledge could be advanced without extrinsic aids that would have been useful and pleasant had they been available. Rigorously systematic examinations were made and their results were accurately recorded; students learned how to inquire into subjective symptoms of neurological diseases and how to test for disturbances of general sensibility and of the special senses, for disorders of motility and of the reflexes, and for deviations from the normal in thought, feeling and behavior; the methods of arriving at decisions regarding the sites of lesions and their nature were discussed and illustrated; typical syndromes became stamped upon the memory of his pupils as paradigms with which atypical symptom-complexes could be compared or contrasted; and

sound and sensible forms of therapy were instituted and their effects upon the patients were carefully watched.

Medical students entering upon the study of neurology with



DR. HENRY M. THOMAS

Thomas were impressed with his enthusiasm for the collection and recording of simple facts, with the conscientiousness, systematic sequence, and precision of his physical examinations, with the rich

storehouse of personal experience upon which he could draw for the interpretation of his findings, with his diligence in bibliographic research in the hope of throwing light upon rarities or obscurities met with in his daily work, with his intense desire to make sure that each patient should receive every good that modern scientific neurology was capable of yielding, and, above all, with his humanity—the sympathy, the encouragement, the cheerfulness and the optimism that radiated from him in the presence of physical or mental distress. He was a noble example of the teacher and practitioner who combines the severity of principles and character of the scientist with the suavity of disposition and the courtesy of demeanor of the true gentleman.

Henry M. Thomas was born in Baltimore in 1861 of Quaker parentage, his father being a well-known physician of that city and one of the trustees of the Johns Hopkins University. After a preliminary education in private schools, he attended Haverford College and later the Johns Hopkins University where he graduated with the degree of A.B. in 1882. His M.D. degree was taken at the Medical College of the University of Maryland three years later. Then followed a most profitable year of postgraduate study in European universities, especially in Heidelberg in Erb's clinic where he acquired a thorough training in the practical clinical technique of neurological investigation and a first-hand acquaintance with the principal organic and functional neurological syndromes. There, too, he studied electrical diagnosis with Schulze and the anatomy of the nervous system with Gegenbaur. Erb was at that time at the acme of his career and the young American student was enormously stimulated by the earnestness of work, the rigor of discipline, the ingenuity of analysis and synthesis, the clarity and simplicity of presentation, the well-filled memory and the solid personality of the German neurologist. When he returned to Baltimore, it was with the aspiration and determination to make his own clinical work approach as closely as possible to the example that had been set him by that great master.

The Johns Hopkins Medical School was not opened until 1893. Meanwhile young Thomas began practice, and secured an appointment as visiting physician to the insane wards at Bay View Hospital, but he spent most of his time in the pathological laboratory under Welch's guidance and in companionship with Councilman, Halsted and Mall. In 1888, he suffered a temporary breakdown from pulmonary tuberculosis and spent a period in the Adirondacks under the supervision of Trudeau, who soon made of his patient an intimate and admiring friend, a relationship which Thomas regarded as one of

the most precious of his experiences. Though his health rapidly improved and the tuberculosis became relatively latent, the infection slowly continued and later in life led to extensive fibrosis and was responsible for the disposition to the secondary pulmonary infection that last year terminated his life.

The Johns Hopkins Hospital had been opened for patients in 1889 and, on the advent of Osler as the professor of medicine, Thomas, who had returned to his work in Baltimore, was captivated by the "Chief," immediately joined the group of eager young clinicians who attached themselves to him and, quickly showing his ability and training in neurology, was placed in charge of the neurological department of the dispensary of the hospital. When the clinical teaching was organized, Thomas found that Osler had delegated the neurological teaching to him. He then entered upon the real work of his life as teacher, consulting practitioner and clinical investigator, and he ran a career that, despite his grave physical handicaps, did credit to his sound training and his opportunities.

He became a member of the local, state, and national medical associations, and was particularly interested in the American Neurological Association, attended its meetings regularly, participating in its programs and discussions, and in 1911 was made its President, choosing as the topic of his presidential address certain features of the life and work of Sir Charles Bell. He was given an honorary M.A. degree by the Johns Hopkins University in 1902, was made president of the board of the Thomas Wilson Sanitarium of Baltimore and a member of the board of managers of Haverford College.

Despite his invalidism, his heavy hospital and school duties and the burdens of private practice Thomas found time to contribute some thirty or more important papers on neurological and biographical subjects. They dealt mainly with organic diseases of the nervous system—cerebrospinal syphilis, tabes, congenital facial diplegia, obstetrical paralysis, neurofibromatosis, lead poisoning and multiple neuritis. His largest and probably his most important article was the contribution to Osler's *Modern Medicine* entitled "Diseases of the Cerebral Bloodvessels"; but his historical papers on the anatomical basis of the Argyll-Robertson pupil (1903) and on the decussation of the pyramids (1910) were noteworthy and valuable, displaying a thorough command of the bibliography and powerful critical judgment.

His home life was ideal. In 1889 he married Josephine Gibson Carey. Of three children born to them, one died in infancy, but two sons survive him; the older (Henry M. Thomas, Jr.) is now associate

in medicine in the Johns Hopkins Medical School, the younger, named after his friend Trudeau, received a Rhodes scholarship at Oxford and is now Master in St. George's School in Newport. The hospitality of the Thomas home in Baltimore was of a quality never to be forgotten by the friends who were privileged to enjoy it.

The capacity of Thomas to inspire affection was phenomenal. After his death, one of his best friends writing to Mrs. Thomas, made the following comments, almost too full of tender feeling to be reproduced here, and yet so truly descriptive that they should not be suppressed: "I was fascinated from the first by his eyes—those dancing mobile eyes, so unlike the slower movement of his speech. But I think it was his laugh that won me. How could anyone hear that laugh and not feel sure of him! And next I think of his rugged downright honesty, calling a spade a spade and detesting all shams, though always with charity—the charity that his laugh first conveyed—even for the shammer.

"He was like a different climate to me as I came to your house—a climate that took possession of me before I could analyze it; and that climate was compounded of the things I've spoken of, interfused with that delicious humor that I should have put close beside the charity of his laughter. Both humor and charity spoke in it and each perfected the other. How often we hear laughter that has one of those properly married components without the other and so is marred without it. His medical wisdom and depth come to my realization after these still more fundamentally endearing qualities of love, humor and flawless honesty."

A man who could have that written of him is not likely soon to be forgotten. Though no longer with us, he lies, like the Athenian dead at Plataea, "possessed of praise that grows not old."

LEWELLYS F. BARKER

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

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ORIGINAL ARTICLES

THE RELATIVE WEIGHT OF THE BRAINCORTEX IN HUMAN RACES AND IN SOME ANIMALS AND THE ASYMMETRY OF THE HEMISPHERES

BY DR. C. U. ARIËNS KAPPERS

DIRECTOR OF THE CENTRAL INSTITUTE FOR BRAIN RESEARCH
AMSTERDAM, HOLLAND

Although many investigations have been made on the weight of the cortex, at least in man, there are great controversies in the results. As the methods, by which the investigators have tried to solve this problem, always were indirect ones, this is not surprising.

So, using the figures, given by Wagner¹ and Calori² concerning the surface of the brain, Donaldson³ (l. c. pp. 202-204) calculated this weight by multiplying the surface with the average depth of the human cortex and its specific weight.

On account of his own measurements (l. c. p. 203) he estimated the average depth of the cortex, which, as we know, is locally varying in man (according to Brodmann⁴) from 1.8 to 4.0 m.M. to be 2.9 m.M. With Obersteiner⁵ he took the S.W. of the human cortex to be 1,034.

¹ Massbestimmungen der Oberfläche des grossen Gehirns. Inaugur. Diss. Göttingen, 1864.

² Del cervello nei due tipi brachicefalo e dolicocefalo italiani. Memorie dell'Accademia delle Scienze dell'istituto di Bologna. Serie seconda, Tomo X, 1870, pp. 142-145.

³ The growth of the brain. A study of the nervous system in relation to education. London, Walter Scott Ltd., 1895.

⁴ Ueber Rindenmessungen. Centralblatt f. Nerven- und Psych., 1908, p. 790, und Lokalisationslehre der Grosshirnrinde. Joh. Ambrosius Barth, Leipzig, 1909.

⁵ The average S.W. found by Obersteiner for the fresh cortex of man is properly 1.03305. Cf. Obersteiner. Anleitung beim Studium des Baues der nervösen Zentralorgane, 5te Auflage Wien, 1912, p. 167, and Centralbl. f. Nervenheilk., 1894.

The average of the S.W. figures found by Danilewsky (already before

Donaldson, improving the researches of Wagner by introducing a correction⁶ for the alcoholic shrinkage of the brainsurface so found the following figures:

Cases	Fresh T.B.W. ⁷	T.W. hem. ⁸	T.W.C. ⁹	Proc. C. hem.
Fuchs	1499 gr.	1312 gr.	743 gr.	56.6%
Gauss	1492 gr.	1306 gr.	731 gr.	55.9%
Workman Krebs.	1273 gr.	1114 gr.	630 gr.	56.5%
Woman 29 years.	1185 gr.	1037 gr.	667 gr.	64.3%
Average				58.3%

The following table was composed by Donaldson on account of the surface extension, found by Calori in 22 brachycephalic and 19 dolichocephalic Italians, measured chiefly in the same way as Wagner did (see below).

Number of cases	Aver. T.B.W.	Aver. T.W. hem.	Aver. T.W.C.	Aver. perc. C. per hem.
19 Brach. Ital. ♂	1336 gr.	1169 gr.	731 gr.	62.5 %
16 Dolich. Ital. ♂	1299 gr.	1135 gr.	690 gr.	60.7 %
3 Brach. Ital. ♀	1148 gr.	1005 gr.	635 gr.	63.2 %
3 Dolich. Ital. ♀	1110 gr.	971 gr.	595 gr.	61.2 %
Average				61.85%

From this we see that, on account of the measurements of Wagner, Donaldson concludes at an average cortex weight percentage of 58.3, on account of those of Calori of 61.85 per hemisphere.

It is not without interest to point out what is meant by weight of hemispheres in such cases. Two methods are used to sever the hemispheres from the remainder of the brain. We understand by hemispheres either all that lies before the corp. quadrigemina ant. or cut them off behind the corpora quadrigemina posteriora (immediately before the pons). The first way is used by Boyd (see below) and then the average weight of the hemispheres is about 87.5 per cent of that of the whole encephalon. The last method (mostly used) is followed by Clapham, Browne and others (including myself).

The determination of the surface has been made by Wagner and Calori almost in the same manner.

The outer surface of the brain was covered by triangles and parallelograms of goldleaf or tinfoil. These again were spread out, measured and counted. The cortex in the depth of the sulci (which is almost two-thirds of the whole surface) was determined by measuring the length and the average depth of the sulci and multiplying

Obersteiner) are also a little less. For the fresh human cortex this investigator found 1.0326. (*Die Quantitativen Bestimmungen der grauen und weissen Substanzen im Gehirn*, Centralbl. f. d. mediz. Wissensch., No. 14, 1880.)

⁶ The figures found by Wagner for the surface of both hemispheres together are: Fuchs 2210 cm², Gauss 2195 cm², Krebs 1876 cm², and woman 2041 cm².

⁷ T.B.W. = Total brain weight to the calamus (without pia).

⁸ T.W. Hem. = Total weight of both hemispheres.

⁹ T.W.C. = Total weight of the cortex of both hemispheres.

those figures with two. It is evident that this method contains a source of errors. Moreover, the correction of the alcoholic shrinkage causes difficulties. Nevertheless such a correction is necessary, because the volume and the surface shrink considerably in alcohol.

This method, determining the cortical surface in alcohol material, was also applied by Jensen¹ on brains of a paralytic, a melancholica, and three idiots. He compared his results with those of Wagner and found that the total cortex surface of his patients varied from 94 per cent to 75.3 per cent of the figures found by Wagner for Gauss, the lowest percentage being that of the brain of an idiot and the other percentages, although remaining below those of Gauss and Fuchs, falling within the group of the woman and the workman examined by Wagner (l. c. p. 752).

His absolute figures are of no avail for my purpose, since he examined pathological material exclusively, and his figures have been derived (as the original ones of Wagner) from alcohol material.

His informations surely would have been of more value if he himself had also measured the surface of some normal brains; comparisons of two authors being less reliable, since different authors rarely make the same mistakes. It is self-evident that with the relative smaller surface of these brains, also a smaller volume and weight of cortex has been calculated in such cases, as is made probable also by the researches of Jäger and Henneberg on pathological material (l. c. *infra*).

While the method of all these authors was based on measuring the surface, the average depth and on multiplying these with the S.W. of the cortex, we see that besides the objections mentioned above, this method contains still another source of errors, viz., the question how to find the average cortical depth, which was estimated by Donaldson to be 2.9, by Jensen 2.98, and by Danilewsky and Henneberg 2.5 m.M.

Jäger² has avoided the use of an average depth figure, determining the volume of the cortex directly with the compensation planimeter (already used by Anton³) in the following way:

The planimetric method had been applied already in 1884 by Conti, who, however, did not determine the whole mass of the cortex, but the relation

¹ Untersuchungen über die Beziehung zwischen Groszhirn und Geistesstörungen an sechs Gehirnen geisteskranker Individuen. Arch. f. Psychiatrie, 1875, Bnd. V, Heft 3.

² R. Jäger. Planimetrische Messungen der Rinden- und Marksubstanz des Groszhirns. Inaugural Dissertation, Halle, 1910.

³ G. Anton. Gehirnmessungen mittels des Kompensationsplanimeters. Wiener Klinische Rundschau, 1903. See also: Zur Kenntniss der Störungen im Oberflächenwachstum des menschlichen Groszhirns, 1ste Mittheilung, Ibidem, Bnd. IX, 1888.

between the white and the grey substance on three levels, the first *before* the basal ganglia, the second *through*, the third *behind* the basal ganglia, in 4 men and 2 women (Rapport entre la substance grise et blanche du cerveau humain, Internationale Monatschrift für Anatomie und Physiologie, Bnd. 1, 1884).

Moreover Dr. Anita Taft has in 157 cases determined planimetrically the relation between the grey and white substance in the transverse level of the optic chiasm. She attained the interesting result that in children, microcephalics and mongoloid idiots the relation was in favor of the grey substance, in normal cases, manic depressives and precox patients in favor of the white substance. See JOURNAL OF NERVOUS AND MENTAL DISEASE, Vol. 47, 1918.

Jäger cut the brain, after it had been put for a short time in 5 per cent formaline, in slices of 1 c.M.

He then first measured the whole surface of each slice (including the external border of the cortex) with the planimeter and afterwards the surface of the non-cortical substance (tracing the internal limit of the cortex). The latter he subtracted from the first and by this means determined the total depth of the cortex of each slice. This figure he multiplied with 1 c.M., thus calculating the volume of the cortex for each slice. For the poles he made corrections.

By multiplying the cortex volume thus found for the total brain with the S.W. 1,034, I determined the weight of the cortex. As, however, in his article the weight of the hemispheres is mentioned in one case only, the weightpercentage of the cortex of the hemispheres could be calculated in that case only. In a normal four years old boy with a total brainweight of 1140 gr. and a weight of both hemispheres together = 997.5 gr., it amounted to 549 gr. or 55 per cent of the weight of the hemispheres (in an adult normal woman he found 557 gr. cortex).

It appears that these figures of Jäger are lower than those calculated by Donaldson from the surface measurements of Wagner and Calori.

Donaldson⁴ himself also tried to determine the weight of the cortex in still another way, viz., by making use of the figures found by de Regibus for the waterpercentage and the S.W. of grey and white substance. If a hemisphere (in casu cortex and white substance without striatum) is weighed and its volume known, we may calculate its average S.W. Knowing that the S.W. of the cortex is 1,034 and that of the white substance 1,041, we may calculate in a given case the relation between the amount of white and grey substance (in casu cortex).

From the figures of de Regibus,⁵ concerning the waterpercentage

⁴ l. c. p. 204.

⁵ Published in Giacomini: Guida allo studio delle circonvoluzioni cerebrali dell'uomo, Torino, 1884.

of grey and white substance (which closely coheres with its S.W.), Donaldson calculated the quantity of cortex and came to a lower figure than calculated by him from the surface tables of Wagner and Calori.

He stated in this way an average of 54.8 per cent only, which is considerably lower than the 58.3 per cent derived from the surface measurements of Wagner and the 61.85 per cent calculated from those of Calori, and closely resembles Jäger's (*vide supra*) result.

No. of the brain	Weight 2 hem.	Weight cortex	Perc. cortex per hem.
No. 1	1277 gr.	720 gr.	56.3%
No. 2	1194 gr.	661 gr.	55.3%
No. 3	1152 gr.	633 gr.	54.9%
No. 4	1067 gr.	562 gr.	52.6%
Average			54.8%

This makes us suppose that the figures found by Wagner and Calori for the surface are too high, a supposition that is confirmed by Henneberg's⁶ work, who determined the surface of the brain in a more exact way. I shall mention Henneberg's method later, but already will mention at once that, whereas Donaldson (l. c. p. 205) on account of Wagner's figures finds a surface of 2,352 c.M². in a brain of 1360 gr. T.B.W., and Calori in a brain of 1325 gr. a surface of 2439 c.M²., Henneberg only finds a surface of 2052 c.M². in a brain of similar weight (1320 gr.), consequently 15 per cent less⁷).

Probably the surface measures of Henneberg are more exact than those of Wagner and Calori. Whereas these authors divided the brain only in hemispheres or lobes, determining the surface hidden in the sulci only indirectly, Henneberg measured this hidden surface also directly, by cutting the cortex (after fixation of the brain in 10 per cent formaline) in pieces of 1 to 3 c.M³. In this way all the cortex-surfaces could be reached easily and measured directly.

For this purpose he used pieces of silkpaper, which does not swell in water, and then he measured all the pieces together by lifting them under water from the cortex and putting them on milligraphpaper. As objects he used (one case excepted) only left hemispheres.

In this way he examined three Hannoverians, one Hottentot, one

⁶ Henneberg. Messung der Oberflächenausdehnung der Grosshirnrinde. Journal für Psychologie und Neurologie, Bnd. 17, 1910-11.

⁷ Tramer, who determined the surface of the right hemisphere of a normal woman of 35 years, came to a figure still 20 per cent lower than Henneberg found for a woman of 26 years. As, however, Tramer does not mention the T.B.W. of his woman, this figure is uncontrollable. It seems too small even for an average female T.B.W. of 1.250 gr. (Henneberg's woman had a high brainweight though, this being 1.320 gr. which however seems to occur more in Hannover; Krause.) See Tramer: Messung und Entwicklung der Rindenoberfläche des menschlichen Grosshirns. Arbeiten aus dem neurologischen Institute Zürich, Bnd. X, 1916.

Herero, and one Javanese. The cortexweight is calculated by taking the S.W. = 1.034 and the average depth with Henneberg⁸ and Danilewsky (1. c.) = 2.5.

Cases		T.B.W.	Average left hem.	Surface left hem.	Cortex left hem.	% Cortex hem.
German I	♂ 45 j.	— ⁹	525 gr.	1082 cM ²	279.5	53.4
German II	♂ 22 j.	1510 gr.	655 gr.	1240 cM ²	320.5	48.9
German III	♀ 26 j.	1320 gr.	565 gr.	1016 cM ²	262.6	46.5
Average.....						49.6
Hottentot	♂	— ⁹	615 gr.	1119 cM ²	289.0	47.0
Herero	♂	1215 gr.	530 gr.	996 cM ²	257.5	48.6
Javanese	♀	1230 gr.	535 gr.	1050 cM ²	271.5	50.7

Hence results that Henneberg found a still lower average percentage for Europeans (49.6 per cent) than Donaldson calculated from the S.W., but also that in his Germans he found variations from 46.5 per cent to 53.4 per cent.

While all these methods of determining the cortexweight are indirect ones, and so probably are more open to errors than a direct method, I made *direct weighings* of the cortex in the following way:

Brains, hardened in formaline,¹ were weighed and afterwards halved in the sagittal diameter. Then the cerebellum and the pons were cut off along the corpora quadrigemina posteriora and the hemispheres were weighed. Afterwards these hemispheres were cut by the microtome of Reichert, in slices of 2 to 3 m.m. During 3–6 hours these slices were colored in an aqueous nigrosine solution (1:1,000), upon which the grey substance marked out almost black against the almost uncolored white substance.

These slices I put on glass plates and severed the cortex by means of a thin knife. Then I weighed the cortex, after all the pieces (cortex and rest of hemisphere) had evaporated so much that the cortex plus the rest represented again the same weight the hemisphere had before being colored in the nigrosine solution. This drying is necessary, as by their large surface the pieces absorb a large quantity of water.

⁸ Henneberg himself made his calculations estimating the S.W. = 1.03; I made them using a S.W. = 1.034, this being more exact. The average difference is 0.3 per cent per hemisphere and 0.12 per cent per T.B.W.

⁹ In this case the total brainweight is not mentioned by Henneberg.

¹ That as well the weight as the volume increase a little (± 1 per cent Flatau) in formaline, does alter the *relation* between cortexweight and hemisphereweight only in a very small proportion. The same avails for the aqueous 1 per cent nigrosine solution. The influence, exercised by the formaline-fixation, in my opinion is even smaller than the greater or smaller quantity of blood in the brain, as the S.W. of the blood is considerable and the vascularization of grey and white substance differs much.

In total 6 brains (12 hemispheres) were treated in this way: three Dutch and three Chinese brains from the Dutch East Indies (formaline material).

My results are expressed not only in percentages of the hemisphere weight, but also in percentages of the T.B.W., the latter giving a more reliable figure for comparison of the left cortex and the right one.

LEFT HEMISPHERES

Cases	T.B.W.	Weight		Weight		%	
		l. hem.	l. cortex	l. rest	p. hem.	T.B.W.	
Dutch X ♂ 29 y.	1068 gr.	-474.5 gr.	237 gr.	237.5 gr.	49.99		22.2
Dutch Gr. ♂ 42 y.	1375 gr.	+618 gr.	+299 gr.	319 gr.	48.38		+21.74
Dutch Bo. ♂ 18 y.	1360½ gr.	-621 gr.	331 gr.	290 gr.	53.3		24.32
Average l...						50.8	
Chinese I. No. 11.	1014.5 gr.	-430 gr.	+218 gr.	212 gr.	50.0		+21.49
Chinese I. No. 10.	1344 gr.	-576 gr.	+300 gr.	276 gr.	52.1		+22.32
Chinese I. No. 12.	1425.5 gr.	-615.5 gr.	313.5 gr.	302 gr.	50.9		22.0
Average l...						51.0	

RIGHT HEMISPHERES

Cases	T.B.W.	Weight		Weight		%	
		r. hem.	r. cortex	r. rest	p. hem.	T.B.W.	
Dutch X ♂ 29 y.	1068 gr.	+477.5 gr.	+238.5 gr.	239 gr.	49.94		+22.33
Dutch Gr. ♂ 42 y.	1375 gr.	-613 gr.	297 gr.	316 gr.	48.4		21.16
Dutch Bo. ♂ 18 y.	1360½ gr.	+622 gr.	+336 gr.	286 gr.	54.0		+24.6
Average r...						50.6	
Chinese I. No. 11.	1014.5 gr.	+437.5 gr.	212.5 gr.	225 gr.	48.61		20.94
Chinese I. No. 10.	1344 gr.	+584 gr.	297 gr.	287 gr.	50.86		22.1
Chinese I. No. 12.	1425.5 gr.	+638 gr.	+320 gr.	318 gr.	50.11		+22.45
Average r...						49.9	
Average for all hemispheres of the Dutch.....						50.65	
Average for all hemispheres of the Chinese.....						50.45	

The halving of the brain being never exact, the cortexpercentage per hemisphere is influenced by the inexact halving of the brain, whereas we use the same constant in expressing the cortexpercentage (right and left) in the total brain weight.

Doing so I found the average cortexpercentage per hemisphere to be 50.65 per cent in the Dutch, this being 1 per cent more than the figures found by Henneberg in his Hannoverians. This amount (1 per cent), however, falls within the individual variations in West European races, showing an upperlimit of 54.0 per cent.

The percentage in the Chinese, mentioned above, differs only 0.2 per cent from the Dutch, which is very little, and falls within the errors inevitable in such examinations. This result is in striking

contrast to Clapham's,² who, estimating the depth of the braincortex in Chinese coolies of Hongkong (and of Pelewislanders), concluded: "Although destitute of any means of accurately measuring the depth of the grey matter of the cerebral convolutions I am convinced that it was appreciably shallower than in the same structure in the average European."

As to an eventual difference between the left and right cortex, my results show that once the right, another time the left cortex was, or seemed to be, a little heavier. I value this difference the less because it depends mostly on absorbed water. If we allow the pieces of cortex half a day to evaporate, the difference between right and left becomes a minimal.

Much has been written on an eventual asymmetry.

Broca³ found in the average the *right* hemisphere of men 1.93 gr. heavier than the left; in women the same hemisphere 0.03 gr. heavier. Boyd,⁴ however, says: "It is a singular fact confirmed by the examination of nearly 200 cases at St. Marylebone in which the hemispheres were weighed separately that almost invariably the weight of the *left* hemisphere exceeded the weight of the right one by at least the eighth of an ounce" (a very small difference indeed, the eighth of an ounce being 3.7 gr., so the difference in an average brain weight of 1,360 gramme would be only 0.27 per cent; Donaldson).

Dr. Thurnam (quoted by Browne) on the contrary again found the *right* one heavier. According to Crichton Browne⁵ it is a question of age. In 400 lunatics he found the right hemisphere predominating with the exception of women between 40 and 60 and men between 50 and 60, inasmuch as here the left hemisphere would be a little heavier. He found the greatest differences to exist under 20 years and then always in favor of the right hemisphere, this also being the case with people older than 70 years.

In contrary to the results above mentioned Franceschi⁶ found in 157 male brains in 49 cases the left hemisphere and in 51 the right one heavier, while in 57 cases they practically were of equal weight.

In 144 female brains he found in 43 cases the left hemisphere, in 46 cases the right one heavier, and in 55 cases both hemispheres of

² Crochley Clapham. On the brain weights of some Chinese and Pelewislanders. *Journal of the Anthropological Society of Great Britain and Ireland*, Vol. VII, 1878, p. 92.

³ Cited by Topinard in his *Eléments d'Anthropologie générale*, pp. 582-583, Paris, 1885.

⁴ Boyd. Tables of weight of the human body and its internal organs, etc. *Philosophical Transactions of the Royal Society of London*, Vol. 151, 1861.

⁵ Crichton Browne. The weight of the brain and its component parts in the insane. *Brain*, Vol. I, 1879, p. 516.

⁶ *Bollettino della Societa di Scienze mediche di Bologna*, 1888. Quoted after Donaldson.

equal weight (or varying in decimals of grammes). Also Wagner (l. c.) and Braune⁷ sometimes found the left, sometimes the right hemisphere a little heavier.

Donaldson supposes that, if the brain is always halved in the same position, *e.g.*, on the base, the occipital pole directed to the cutter, a right-handed anatomist will always make the same error.

This personal error, in halving the brain, vanishes in weighing only the cortex, as the cortex of both hemispheres nowhere meets, the cortex of each hemisphere being isolated. So the comparison of the quantity of cortex in the right hemisphere and the left one gives a more trustworthy criterion for an eventual asymmetry, especially if we express both in the same constant, *viz.*, in per cent of T.B.W. The figures found by myself also prove that none of the hemispheres is constantly superior in cortexpercentage.⁸

In three cases (marked in my table by †) the right cortex was a little heavier, in three other cases (marked also by †) the left. Heneberg, though examining chiefly left hemispheres, has in one case (his European No. III with a T.B.W. = 1,320 gr.) compared the surfaces of both hemispheres and found on the right 1,035 c.M²., on the left 1,026 c.M²., the result (multiplied with 2.5 as average depth and 1,034 as S.W.) being only a difference of fully five grammes (0.3 per cent per T.B.W.) in favor of the right cortex. This figure is within the radius of errors, as is also the average surplus of the right cortex in some of my brains (4.3 gr.) and of the left one in others (3.5 gr.).

My results show at best that the left cortex and the right one never are exactly equal in weight and that once the left and another time the right one is or seems a little heavier. Nor in animals did I find a constant preponderance (see below). This accords with the results of Franceschi, Wagner, and Braune, who, too, in the hemispheres found sometimes the left, sometimes the right one a little heavier.

Moreover my results show that halving the brain is a very poor way indeed to determine any *superiority* of one hemisphere. Whereas of my six brains in one case only the left hemisphere was heavier, in the other five cases the right one, the cortex determinations show that in three cases the left cortex percentage per T.B.W. was heavier, in the other three the right one. So in two cases (Chinese 11 and 10)

⁷ Braune. Das Gewichtsverhältnisz der rechten und linken Hirnhälfte beim Menschen. Arch. f. Anat. und Physiol., 1891.

⁸ This does not eo ipso exclude (areal) local weight asymmetries, although I doubt their constancy. See, however, also Mellus, Anat. Record, V, 1911.

in which the left hemisphere seemed to be lighter the cortex was nevertheless heavier.

Here already I should like to remark, that the calculation of cortex percentage per T.B.W. is of value only for the mutual comparison of the right cortex and left one of one and the same cerebrum, not for the cortex percentages of different individuals, as in another paper (see the following issue of this JOURNAL) I shall prove that the weight of the cerebellum (being an important factor also in the T.B.W.) shows very large personal variations, as well in the Dutch as in the Chinese (from 8 to 12 per cent of the T.B.W.).

To conclude some remarks on the cortexweight in animals.

Nor here direct weighings have ever been made.

Wagner measured the surface of the cortex in an Orang, and found it to be 533.5 c.M²., and Henneberg found in an Ateles (with a T.B.W. = 142.5 gr. and a hemisphere weight = 64.5 gr.) a surface of 172 c.M². As, however, neither the average depth nor the S.W. of the cortex is mentioned for these animals,⁹ we cannot conclude from these figures to a weight percentage.

Supposing the S.W. in Wagner's case also to be 1,034, and the average depth = 2.47 b.M², the Orang of Wagner would have a cortexweight almost equal to the cortexweight of my Orang.

I weighed the cortex of a Marsupial (*Macropus robustus*), an Edentate (*Choloepus didactylus*), an Ungulate (horse), a Carnivore (dog), two katarrhine apes (*Semnopithecus cephalopterus* and *Hylobates syndactylus*), and an Anthropoid (Orang). The figures found for these animals are shown in the following table.

Examining these figures more closely, we observe that, in each of these animals, the average cortexpercentage of both hemispheres is as large, or in most cases (*Choloepus*, Dog, *Hylobates* and Orang) even larger than in Man, this being a consequence of the fact (see below) that smaller brains generally have more grey matter than white matter. So we also understand the observation of Miss Taft, who found in children, microcephalics (and mongoloid idiots) a cortexpercentage, large than in normals (l. c.).

Next to this statement two more facts are striking in this table.

LEFT HEMISPHERES

Animals	T.B.W.	Weight l. hem.	Weight l. cortex	Weight l. rest	% cortex per hem.	% cortex p. T.B.W.
<i>Macropus rob.</i>	55 gr.	20.5 gr.	10 gr.	10.5 gr.	48.7	18.2
<i>Choloepus did.</i>	34 gr.	13.1 gr.	7.1 gr.	6 gr.	53.8	+20.88
<i>Canis fam.</i>	78.5 gr.	34.1 gr.	21.1 gr.	13 gr.	61.9	+26.95
<i>Equus cab.</i>	510 gr.	187.2 gr.	96.2 gr.	91 gr.	51.3	+18.86
<i>Semnopith. ceph.</i>	65 gr.	27.6 gr.	13.1 gr.	14.5 gr.	47.3	20.15
<i>Hylobates syn.</i>	105 gr.	43.0 gr.	25 gr.	18.0 gr.	58.14	23.8
<i>Simia satyrus</i>	293 gr.	122.7 gr.	67.2 gr.	55.5 gr.	54.77	22.87

⁹ According to Marburg the average depth of the cortex, calculated from the frontal, central, temporal and occipital lobes, is even a little larger (2.83 m.m.) in the Orang than in man (l. c. infra, p. 585).

RIGHT HEMISPHERES

Animals	T.B.W.	Weight r. hem.	Weight r. cortex	Weight r. rest	% cortex per hem.	% cortex p. T.B.W.
Macropus rob.	55 gr.	20.5 gr.	10 gr.	10.5 gr.	48.7	18.2
Choloepus did.	34 gr.	13 gr.	7 gr.	6 gr.	53.8	20.58
Canis fam.	78.5 gr.	33 gr.	20.5 gr.	10.5 gr.	62.1	26.18
Canis f. collie.	77.7 gr.	32.35 gr.	20.0 gr.	12.35 gr.	61.9	25.74
Equus cab.	510 gr.	185 gr.	96 gr.	89 gr.	51.9	18.82
Semnopith. ceph.	65 gr.	26.5 gr.	13.5 gr.	13 gr.	51.0	+20.77
Hylobates syn.	105 gr.	44 gr.	25.5 gr.	18.5 gr.	58	+24.3
Simia satyrus	293 gr.	122.5 gr.	69.5 gr.	53.0 gr.	56.73	+23.64

Firstly, the high cortexweight per T.B.W. in *Canis* is astonishing,¹ especially in comparison with *Semnopithecus*, which has a smaller brainweight and a higher standing in the phylogenetic series. With both these facts we should rather expect a larger cortexpercentage in *Semnopithecus*, the larger development of the brain in apes causing the pallium to be developed more than the stem.

That a heavier cerebrum ought to have less cortex relatively than a lighter one (at least in the same group or in related animals) is explained by Ernst de Vries² and Hovy,³ who showed that if the brain volume increases (in related groups) the white matter must increase relatively more than the grey one.⁴

Now dogs and apes are not related but still both are gyrencephalic animals and by the lower standing of the dog as well as by his larger brain volume we would expect *Canis* to have a lower cortexpercentage than *Semnopithecus*.

This not being the case, but on the contrary *Canis* having a surprisingly high cortexpercentage, this consequently can be explained only by the large development of the cortex and the depth of the sulci in this animal.

It would not surprise me if the relation between the superficial cortex and the hidden cortex (being in man in the average 1:2 and in Orang 1:1.56) would be larger in *Canis*.

That the mantle of the brain is exceedingly developed in the first dog, also results from the fact that his hemispheres amount to 86.8 per cent of the T.B.W. (in the collie 83.3 per cent), in my apes the average being 82.0 per cent only.

A second remarkable fact is the high cortexpercentage in *Hylobates*. Although the cortex percentage in the Orang as well as in *Hylobates* is high, in the latter it is still higher than in the former.

¹ A second examination of the right hemisphere of a collie confirmed this fact, which besides is also in harmony with the results of Danilewsky (l.c.).

² Ernst de Vries. Das Corpus striatum der Säugetiere. Anat. Anzeiger, Bnd. 37, 1910.

³ Hovy. On the relation between the quantity of white and grey substance in the central nervous system. These Proceedings, 16, p. 311, 1913.

⁴ The lower cortexpercentage in *Equus* falls within this group.

We cannot be surprised that in the Orang the cortexpercentage per T.B.W. is higher than in *Semnopithecus*, since in anthropoids the mantle of the cerebrum is more developed than in *Semnopithecus*.

That however *Hylobates* has a higher cortexpercentage than the Orang cannot be explained by its smaller brainvolume alone, since from this standpoint the cortexpercentage in the still smaller brain of *Semnopithecus* ought to be still higher than in *Hylobates*. Which is not so.

That *Hylobates* has a greater percentage than *both* other apes can be only explained by a larger depth of the cortex in *Hylobates* than in the other apes mentioned above.

This explanation agrees with the measurements of Marburg.⁵ This author also emphasizes "dasz die Rindenbreite des *Hylobates* absolut gröszter ist als die des Orangs, letzere aber gröszter als die der anderen untersuchten Affen." (l. c. p. 596.)

This is in perfect harmony with my results.

At last still one remark.

Comparing my results with those of Donaldson⁶ for the Norwegian rat, we find (l. c. p. 87) the cortexvolume (XX): being 393.15 m.m., the spec. weight = 1.05 (l. c. p. 76), the cortexweight to be 0.4128 gr. in the rat. The brainweight in this group being 2.054 gr. (l. c. p. 87), the relation of the T.W.C. to the total brainweight = 20.1 per cent or in one hemisphere 10.05 per cent per T.W.B.

This is a much smaller percentage than in my animals and in man. We know, however, that in most gyrencephalic animals more cortex is found in the sulci than on the surface, and ought to consider that the rat is lissencephalic. Were apes and man also lissencephalic, *i.e.*, were there no cortex hidden in the sulci, the cortexpercentage of a hemisphere per T.W.B. would be even less than in the rat and amount to 7 per cent scarcely, whereas it actually is in man and the higher apes more than 22 per cent per T.B.W.

So also by my figures we may realize the great importance and necessity of fissuration for higher cortical development.

⁵ Marburg. Beiträge zur Kenntniz der Groszhirnrinde der Affen. Arbeiten aus dem Neurolog. Institut in Wien, 1907.

⁶ Donaldson. The rat. 2d ed., Memoirs Wistar Instit., Philadelphia, 1924.

CONSTITUTIONAL PSYCHOLOGICAL FACTORS IN "FUNCTIONAL" PSYCHOSES

I. MANIC-DEPRESSIVE INSANITY

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I have for some time been trying to find means of a systematic description of the two so-called functional psychoses, manic-depressive insanity and dementia precox, and, if possible, a theory by which these disorders might be interpreted. I had already been struggling with this problem for several months when an article by Professor McDougall appeared in the *British Journal of Medical Psychology* (Vol. V, Part III) where he suggests a new theory of manic-depressive insanity, based on his famous doctrine of instincts. This article influenced my continued speculation. It led me to keep in mind all the time the two aspects of the disorder, the one of Professor McDougall and the one I had tentatively devised myself as a working hypothesis, and that is why, when I here venture to submit to consideration and criticism my view on manic-depressive insanity in a paper, this paper has taken partly the form of an attempt to test the validity of the two aspects by applying them to clinical observations.

To make it possible for an audience to follow this procedure it is necessary to present first the main features of the two aspects. Professor McDougall develops his theory in short as follows:

"Most of us, perhaps all of us, are liable to mild alternations of . . . moods of 'excitement' and depression. . . . When the liability to such alternations is well marked the personality is said to be of the cyclothymic type.

"It would seem that the alternations of the excited and depressed phases of the manic-depressive patient are but exaggerations of these changes of mood. If we provisionally accept this view, we may obtain, by reflection upon our own experience of such moods, a suggestion for the theory of the manic-depressive disorder. . . .

"When we are in a depressed mood, when we take a gloomy view of life in general, we take a gloomy view of ourselves . . . the gloomy view of things in general is secondary to and derived from the gloomy view of oneself. This attitude may be expressed in the words, 'The world may be a decent enough sort of place, but what

good is it to me? I am a poor incompetent creature, incapable of playing a proper part in it, of enjoying it: my efforts to accomplish something of value lead to nothing, all the world knows that I am a poor creature.'

"On the other hand, in the bright, active, joyous mood one views the world joyously because one feels strong and capable, ready to grapple with any emergency of difficulty, confident of success. Even though on intellectual ground a man may regard the world as a poor thing, a 'rotten show,' in which there is little ground for rejoicing, yet, in the mood I speak of, he contemplates it with equanimity or positive satisfaction, regarding it either cynically as an egg to be cracked and sucked by himself or altruistically as a field for his activities, a scene of disorder to be put to rights by his efforts.

"If we imagine these two opposite moods intensified and prolonged we have the picture of the depressive and the manic phase of manic-depressive disorder. . . . The characteristic mark of the depressed phase is that the patient takes a low, depressed view of himself, declares that he is a miserable sinner, a wretched useless creature; that he has committed dreadful imaginary crimes and expects corresponding treatment in this world and the next; that he is incapable of coping with the world by reason of moral and physical deficiencies of the most varied kinds.

"On the other hand, in the exalted phase the patient displays an attitude of lofty superiority, an exaggerated belief in his own capacities, there is nothing he cannot achieve; he feels and therefore believes that physically and mentally he is a superman. . . . The patient busies himself with ceaseless boastful talk of great plans, he explains his case to his physician with the utmost confidence in his own view and writes grandiose letters to persons of exalted station.

"How then does the patient in these two phases, the exalted and the depressed, differ from the normal man? The normal man takes a sober balanced view of himself and his relations to the world; and he does this in virtue of the constant interplay of the two fundamental tendencies of his instinctive nature, namely, the tendency to self-assertion and self-submission. These two tendencies are the principal tendencies incorporated in his sentiment of self-regard. In the man of normal disposition and development, these two tendencies are constantly at work during all self-conscious reflection. The one prompts him to attempt any line of action that may seem in any way attractive, to regard himself as capable of all achievements, as superior to all other men in all respects. And when the promptings of this tendency carry him to success, whether actually or merely in

imagination; his satisfaction takes the special form which we call 'joy' or perhaps more properly 'elation.'

"The other tendency, the submissive tendency, on the other hand, prompts him to defer to others, to be docile, to submit and obey, to take a lowly view of himself and all his capacities and achievements; to bow down beneath hard blows and to suffer in silence. And the normal man's estimate of himself, varying as it does from time to time, even from moment to moment, according as one or other of these two tendencies predominate, is the product of the coöperation and reciprocal influence of these two opposed tendencies. . . .

"The essence of my suggestion towards a theory of the manic-depressive disorder is that the disorder results from the upsetting or disturbance of the normal balance and coöperation of these two impulses within the sentiment of self-regard.

"There are three ways in which we can suppose this balance to be upset in favor of one or the other of the two impulses. First, external circumstances may be such as greatly to favor one relatively to the other. . . . Secondly, changes of the bodily metabolism may have similar effects. . . . Thirdly, the seat of the disorder may be within the structure of the self-regarding sentiment itself; there may occur within it something of the nature of a dissociative process that prevents the due reciprocal influences between the two impulses.

"The predominant emotion of the manic condition is elation; but another emotion is so commonly displayed to excess . . . that it might be regarded as a characteristic of the condition, namely, anger. This fact may be seen to be entirely in harmony with my hypotheses, if we consider the conditions that evoke anger. The anger impulse is normally evoked by any thwarting of any other impulse. Therefore, if any one instinctive impulse becomes abnormally intensified, we may expect to find also an increased irritability or rather irascibility. But the self-assertive impulse is peculiarly apt to occasion anger; because it is so constantly in play in all social relations, and can suffer thwarting, not only through the overt actions of others, but through a mere word or gesture or facial expression, or even through mere passivity or indifference, a lack of submissive response on the part of others. . . .

"Anger is then a secondary feature of mania. . . .

"Just as the primary and fundamental affect of mania (namely, elation) is apt to be complicated by anger, so the primary and fundamental affect of the depressive phase, namely, self-abasement, is peculiarly liable to be complicated by fear. And this fact is also in harmony with the hypotheses. When we are dominated by the sub-

missive impulse, we feel small and weak, and other powers seem vast and overwhelming; we cannot stand up against them. If then the impulse becomes morbidly intensified, it is natural that the imagination shall take a fearful turn."

I have tried to select the quotations which have been given above in such a way as to present a general picture of Professor McDougall's theory. There are several features of this which, however, have not been brought out by the selection. For further information about the theory I have consequently to refer the reader to Professor McDougall's original article.

In analyzing the manic-depressive disorder and dementia precox I have taken as a starting point, just as Professor McDougall, the conception of a cycloid and a schizoid constitutional type. The meaning of the two terms, cycloid and schizoid, has, however, been somewhat restricted, compared with the way in which they have been used by other authors. By being of the cycloid type I mean only to have an innate disposition for moodiness and oscillations of mood between elation and melancholia. By being of the schizoid type I mean to have an innate disposition to split, in the psychiatric sense of that word. What it is in the human organism that carries these dispositions we do not know, and no speculations about the matter are intended in the following.

A second starting point from another angle, I have found in the assumption of an innate disposition for the development of egocentric personality traits and another innate disposition for the development of what I will call altrocentric personality traits, by latter term indicating the opposite of the former. These two dispositions will in the following as a matter of convenience be called the E- and A-tendencies. By a number of authors they have been considered as parts of the schizoid and cycloid make-up respectively. My reasons for considering them independent by birth of the y and x which constitute the tendency to split and the tendency to develop moodiness will come out during my discussion and will be summarized later. Let us at present consider and describe the altrocentric and egocentric personality traits as manifested in the behavior of the human being. The first question will then be: Which are these traits? Below follows a list of the most outstanding ones:

Altrocentric traits:

Extrospective	Introspective
Extroactive	Seclusive
Sympathetic (altruistic).	Egotistic

Egocentric traits:

In this table six personality traits have been given in three pairs of opposites. A general description of these traits can be as follows:

1. An extrospective individual is one who seeks his information about life in the study of others. An introspective individual on the other hand is one who seeks his information about life in the study of himself.

2. An extroactive individual is one who in his activities seeks contact with his fellow-creatures, either he opposes, coöperates with or leads them. A seclusive individual is one who avoids social contact in his doings.

3. A sympathetic individual is one whose interests swing with the interests of his fellow-men and whose value in life is the satisfaction of humanity rather than the ego. An egotistic individual is one whose interests are concentrated around himself and whose chief urge in life is toward satisfaction of the self.

To avoid misunderstanding it should be clearly recognized that all the six traits we have now defined are of decided social significance.

The three traits to the left of the table can all be grouped as *altrocentric*, the three to the right as *egocentric*, for reasons that need not be further commented upon. The *altrocentric* traits may perhaps roughly cover the extrovert and the *egocentric* the introvert, as understood by Jung and psychologists in general.

It should be emphasized strongly that the treatment of two traits of a pair as opposites does not imply that these traits necessarily exclude each other in one and the same individual. A person might very well be both extrospective and introspective, he might be extroactive in certain responses and seclusive in others and he may be capable of sympathizing with others although he is in some degree egotistic. Might it not in fact be said that well adjusted conduct is highly determined just by a suitable balance of all the six traits? The aspect of considering these traits as opposites has been taken only in order to suggest that when one trait of each pair develops to a particularly high degree a tendency appears for the opposite trait of the pair to diminish. Thus when the introspective tendency gets the overhand there will be less inclination in the individual to seek his information about things outside himself, when seclusiveness gets predominance, extroactive response decreases and when egotism gets powerful the capacity to feel with and for others disappears, and *vice versa*.

Besides this possibility for each of the traits of the table to occur in moderate degree together with a moderate degree of the opposite,

each of the traits of any one pair may be combined with any one of the other traits. Thus we might get a large number of combinations which are all true to life.

Below follows a few general descriptions of some different personality types which may result of such combinations of altrocentric and egocentric traits:

We may for an instance have an extrospective egotist. He would be a man who uses information obtained through extrospection entirely to his own satisfaction. His picture would differ depending upon whether he is extroactive or seclusive: If he is extrospective, egotistic and extroactive, he will use his collaborated information as a means of social self-display. If he is extrospective, egotistic and seclusive, he will refuse social intercourse and please himself with the thought of his own superiority and the unworthiness of his fellow-men to take part in his elaborations.

As another example we may have an extroactive and introspective individual. He would be a man who receives his information through introspection and has a tendency to communicate with people not so much in order to receive as to give. If he in addition to being extroactive and introspective is egotistic he will like to display his ideas socially in order to assert himself. Being egotistic he easily gets insistent, becomes a nuisance to his environment and is liable to be characterized by his fellow-creatures as conceited.

The combinations of personality traits which I have just given are only a few examples of how different constellations of such traits may determine different personality types. Many more examples could be given which space does not allow.

Although, as has been stated, anyone of the six personality traits we are discussing, might combine with any one of the others we should not be blind to the fact that certain of the traits have a tendency to combine easier than the others. Thus the altrocentric traits combine very easily with each other on one hand, the egocentric with each other on the other hand. It is probably the recognition of this tendency that originally led to the establishment of the conception of the extrovert and the introvert.

The study of the mental growth of children yields no information on the basis of which we may claim priority for any one of the altrocentric or the egocentric traits. If they turn out to form definitely combinations within the group the manifestations of the compound show from the very beginning both the cognitive, the conative and the affective signs, and a discrimination in time of one from the other during the genesis can not be made. If we want to assume on

theoretical ground that one of the pairs is deeper rooted in the individual's make-up than the others, would it not be fair to choose sympathy and egotism, the two traits which have to do with the conative-affective side of mental activity and thus with the fundamental urges of life? There are certain practical advantages in such an assumption which makes it justifiable not only from a theoretical point of view but also from the point of view of utility. This might be illustrated by a few experiences from the psychiatric clinic:

In deciding upon a diagnosis of manic-depressive insanity or precox an important matter of information is a personal history complete enough to throw light on the prepsychotic personality of the patient. If such a history presents to us manifestations of true introversion (egocentricity), this is a plus for precox and a minus for manic-depressive insanity; if on the other hand the history presents manifestations of true extroversion (altrocentricity) this is a plus for manic-depressive insanity and a minus for precox. The interpretation of the history in this respect is often difficult, because essential features are not discriminated from non-essential ones. An example: A young boy, age seventeen, showing in his state of illness rather suggestive precox symptoms. His prepsychotic history indicates that in his social interaction he was not seclusive but extroactive, even somewhat of a leader. This implies superficially that he is an extrovert by make-up (altrocentric) and thus, if he would really turn out to be an indisputable precox that he would be an exception from the rule that precoxes generally are of introverted type in their prepsychotic period. I suggest that a further study of his early history would have brought out that the boy although extroactive was egotistic, displaying himself socially, not because of sympathy with his fellow-men but because of a powerful desire to assert himself, receive gratification for the ego. A strong recognition of egotism as the most fundamental trait in the introvert (egocentric) would have left us unsatisfied with the material already obtained and led us to continue the study. Another example: A man about the age of thirty-five, a typical paranoid precox. Personal history tells us that he has been a capable officer in the army. In his position he has had to deal extensively with people, he has had to display considerable extroactivity. Could he be an introvert (egocentric)? The history tells us further that he was never liked by the men. He kept a strict discipline according to rule and routine, disregarding entirely personal factors in the management of his subordinates. This suggests undoubtedly that he had no sympathy with his men and lacked interest in them to an extent to be indifferent even for the satisfac-

tion derived of being popular. Thus he probably possesses the fundamental trait of the introvert or egocentric, namely, egotism, although he by condition is forced to display superficially the extroverted (altrocentric) conduct.

I have suggested that we consider the A- and E-tendencies as constitutional, present in germs at the birth of the individual. Together with these innate dispositions the human being has others, such as the instincts. In the development of an individual during the process of adjustment to life there is naturally an interaction, eventually with conflict between different innate tendencies, an interaction which might result in modification or inhibition of one or another of these. Environmental conditions thwarting the impulses derived from these tendencies will obviously also be important agents in this combat. Let us now for a while speculate upon the problem, how the A- and E-tendencies may affect the relative growth of the two instincts which are crucial in this discussion, the self-assertive and the self-submissive instinct. May we not recognize that strong altrocentric disposition, if the display of the tendency is not thwarted during life might further and strengthen the instinct of self-assertion? A person who is extrospective, extroactive and sympathetic easily might become self-assertive, if his way of looking on, acting on and feeling towards his social environment meets with approval. With increasing self-assertiveness often goes some degree of egotism, but this is kept in bounds by the strong sympathetic trend, which is the fundamental of the dominating A-tendency. If on the other hand the altrocentric activities are thwarted and met with disapproval this might well be the ground for furthering the development of the self-submissive instinct. The individual, retaining his sympathy and his interest in social environment both the active, the intellectual and the affective part of it resigns, faced with the thwartings, from leadership, submits and becomes a follower, perhaps a hero-worshipper. Thus we have seen that a strong A-tendency might further both the self-assertive and the self-submissive instinct depending upon conditions.

Let us now carry our speculations further and consider how strong E-tendencies might act upon the same instincts. It seems rather obvious that an individual who possesses strongly the fundamental egocentric trait of egotism might develop strong self-assertive tendencies. In doing this he has to give up seclusiveness and act upon his environment in some or other way. He might superficially look as if he were altrocentric but his motives reveal the absence of sympathy. Society does not interest him except as a means of self-

display, self-assertion and self-satisfaction. Just as easy as it is for the egotistic individual to become strongly self-assertive, just as difficult, even impossible, is it for him to submit. If thwarted intensely in his self-display, he might fall back into seclusiveness, but this does not mean that he gives in. He withdraws into his shell, refuses social intercourse but does not truly resign or submit. He still dwells in his imagination on his own superiority and thus asserts himself in his own fantasy. He is like a sulking child.

Let us now for a moment return to the theory of Professor McDougall. He suggests that the manic phase of manic-depressive insanity is fundamentally an overbalance of the self-assertive instinct, the depressed phase of the self-submissive instinct. I have above tried to show that the self-assertive tendency might be furthered by both the A- and the E-tendency, while the self-submissive tendency might be furthered by the A-tendency but is entirely excluded by the E-tendency. If this is true and Professor McDougall's theory at the same time holds, we would expect to find in the psychotic personality of the manic-depressive manic either strong *altrocentric* traits or strong *egocentric* traits or both, while we in the manic-depressive depression would well expect *altrocentric* traits but under no conditions *egocentric*. We continue the study by trying to determine to what extent clinical facts meet these expectations.

The method would be to apply the six personality traits we have distinguished on the manic-depressive manic and on the manic-depressive depression and see which of them fit in with the typical picture of each of the two phases of the disorder. In all instances we have to consider only the syndromes of non-confused insane, as in confusion and delirium the personality traits become blurred and indistinct.

In considering the depressions we have to distinguish not less than three different types: (1) Retarded depressions, (2) non-retarded, non-agitated depressions, and (3) agitated depressions.

From the large group of agitated depressions we have to separate out these patients who show just a non-purposive restlessness without any discriminable motive in either ideation or conduct. They are in a mental condition of general excitement, and thus, in my opinion confused in the sense in which I have tried to interpret confusion in a previous paper. All kinds of conflicting impulses are playing on them in a vacillating way which makes impossible the persistency of any one directed trend of experience. Every now and then, when spoken to, they may come out of the confusion momentarily and give a relevant answer, showing good orientation both for time and place.

This particular picture of the agitated depression has a parallel in the manic phase of manic-depressive disorder. The confused manic and the generally excited restless depression are both characterized by increased motor urge. Just like the restless depression the confused manic may temporarily come out of the confusion and give a relevant account of something he is questioned about and immediately afterward go back into the confusion. Then one day he may come out of the confusion clear for a longer period of time. He is now characterized by a tremendous drive of activity, but is capable of maintaining a purposive trend of thought and action. This is when he plans grandiose projects of reform for the hospital where he is a patient and what not. This clear phase of the manic is analogous to the clear phase of the agitated depression, when the depressed patient will display in an agitated manner a logical trend of thought bearing on his delusions of unworthiness. According to psychiatrists the oscillation in and out of confusion is more common in the manic than in the agitated depression, which does not, however, disprove that there is a principal parallelism between the phenomena when they occur in the two phases of the disorder.

We will now proceed with the analysis of the personality traits of the manic-depressive manic: I think we have to say that the manic is predominantly extrospective. He follows what is going on around him rather with curiosity, paying attention even to small details of things. He might notice a hair on the collar of your suit and a cracked button on your vest which normal people would fail to observe. I have seen clear manics pick up information surprisingly fast regarding administrative events of the hospital, changes in staff and things like that. The information obtained by the manic through introspection I should think is limited to the very crude fact that he exists, very much so indeed, he knows that he is great and capable of everything, but he lacks the capacity of discriminating introspection that is necessary for true self-knowledge and insight. Considering the second pair of personality traits, we hardly need to comment upon the fact that the manic-depressive manic is extroactive to a degree which excludes seclusiveness concerning any subject. Third pair: Has the manic sympathy with others? I feel sure he has. He might have difficulties in sympathizing with suffering due to his mood, on the other hand he takes part in the pleasure and happiness of others. He enjoys a conversation and a funny story. He springs jokes himself and appreciates when others laugh at them. He has humor, something that we do not find in people lacking sympathy. And yet, the manic is egotistic at the same time as sympathetic and in fact the

egotism is stronger than the sympathy. He feels that he is number one and is immensely proud of himself. As such he asserts himself at every occasion. If opposed in this self-assertion, he gets mad and strikes or scolds without hesitation. That is why anger is such a typical feature of his picture as McDougall has rightly pointed out.

About the retarded depression we know very little as far as the personality traits are concerned. His thinking and doing is too retarded to allow an interpretable behavior. He moves, so to say, mentally and physically in molasses. Some vague indications seem to point to the fact that what there is of spection in the retarded depression is introspection. He probably dwells on his own *misère* most of the time. Superficially he seems seclusive, but this feature might be due only to the retardation. In visiting and talking to these depressions you often get an impression that they try their very best to display, but their attempts rarely reach an expression because of the fact that the effort necessary to break through the retardation is beyond their power. Thus in his intentions the retarded depression may or may not be extroactive. I would judge that the retarded depression lacks sympathy. His preoccupation with his own troubles probably prohibits him to feel with others. This is about all we can say about the personality of the retarded depression as manifested in the psychotic picture. The study of the onset of the disorder and of the immediately preceding period on the other hand suggests a few facts from which we may draw inferences about certain features of the disordered personality.

If we study the onset of the depression, and this onset is from the point of view of presenting modifications in personality traits similar whether the depression turns into the retarded or the non-retarded type, we will find that it begins with a vague magnification of the interests in the self. At first this might show itself only in an overconscientiousness in one's own doings. A tendency to introspect and to dwell on everything referring to the self appears and increases gradually. With this tendency follows signs of a faulty evaluation of happenings referring to the ego. Things that inflict pain on the self, even in the faintest degree, are exaggerated and given an undue importance and are thus made a cause of rather unreasonable worry. I suggest that this faulty evaluation of things is a natural consequence of the overconsidering of the self. The trait expressed in this trend can, I think, be called egotism in a true although perhaps not very extreme sense. It may not at all take the form of self-pride, but it involves a disability of self-forgetfulness, indicating without much doubt some degree of overevaluation of the

self. It is suggestive to think that this feature remains and perhaps gets exaggerated in the retarded depression though its display is prohibited by the retardation.

If we now pass over to the other two types of depression the dominance of the egotistical trend in the picture becomes more noticeable. Between the non-retarded, non-agitated depression and the agitated depression we have all grades of intermediate types. If we want to grade this scale in terms of personality traits we might say that its ends should be marked as seclusive type and extroactive type. About the seclusive non-retarded depression as about the retarded we know very little, and what we know is mostly inference from what is displayed in the non-seclusive. As a matter of convenience I consequently will start with an attempt to analyze the extroactive depression or as we commonly call him the agitated.

Is the agitated depression extrospective or introspective? I think he is predominantly introspective. He probably dwells most of the time on his misery, his sinfulness and unworthiness. It has already been brought out that the agitated depression in his conduct is definitely extroactive, a trait that he has in common with the manic. Is he sympathetic? I think he is too preoccupied with himself and his own suffering to have room for any deep feelings with others. He might very well say: "All the world is going to vanish because of my sinfulness," but behind this utterance is less sympathy with the fate of the world than desire to indulge in his own rôle in the universe. Such exaggerations beyond any limit are typical of the agitated depression. Now I venture to suggest that any exaggeration of anything referring to the self either in a direction toward good or evil is to some extent an expression of egotism and a manifestation of a certain degree of self-assertion. One who wants to be on the peak under any conditions, whether as the best of humanity or as the worst, displays an egotistical trend of personality make-up, and the urge toward such an attitude, even if manifested in extreme self-humiliation, is an urge of self-assertion. There is a famous story bearing on that point about a humble Swede, meeting his friend, the Norwegian. During the conversation the former, in one or another connection, states the sad fact that there are quite a number of foolish people in his country, whereupon the Norwegian, with pride and self-satisfaction exclaims: "We have much bigger fools in Norway." The view that a considerable self-assertion is characteristic of the agitated depression is supported by the fact that this patient, when opposed in his display of self-accusation, gets irritable or angry, just as the manic does when he gets thwarted. Really, could in any

respect the agitated depression be considered to show signs of self-submission? Would we not expect from a self-submissive individual that he would listen to and give in to reason? The agitated depression does not. Or would we not expect that the self-submissive, even if he could not grasp the point of an argument, would let himself be persuaded about something without recognition of why? The agitated depression does not. Would we at least not expect of the self-submissive, particularly of the extremely self-submissive, that he is suggestible? The agitated depression is not. Thus I fail to see the manifestations of a predominance of the self-submissive tendency in the agitated depression, while numerous traits rather suggest a self-assertive trend. The agitated depression seems by his diseased condition to be bound to assert himself in the direction of extreme self-humiliation, just as the manic by his condition is bound to assert himself in the opposite.

We cannot leave the agitated depression without touching on the rôle of the display in his disorder. It seems to be without any doubt that in many cases the display gives a certain relief to the patient. He wears off his urge and thus his emotion in the bodily and verbal expression. It may perhaps be exaggerated to say, although it sometimes seems so, that certain patients get a positive pleasure out of the display, which is the pleasure of self-assertion, and which gives them a compensatory satisfaction. But, lo! nature has many phases. What brings to certain individuals relief causes in others intense suffering. In displaying, many of these agitated depressions work themselves into true and omnipotent agony. This is probably a matter of autosuggestion and has its parallel among nonpsychotic in numerous neurotics who from states of apparent calmness might work themselves into violent emotional fits, also in well known instances of child life where the imagining of things, originally started as play, might attain qualities of reality through autosuggestion and give rise to true affect. In this process of self-suggestion the displayed behavior, particularly the spoken word, is a powerful agent. I propose that such autosuggestion is the mechanism behind the states of tremendous agony and fear in which we sometimes see cases of agitated depression. In a number of these cases we see an interesting development, when the disease has run through long periods of time, which by psychiatrists is called "habit formation," where the display gets limited to certain stereotyped acts or utterances and where no affect apparently is present with the display. May not that be explained by the fact that due to extensive repetition the display loses its autosuggestive power and fades into dead form.

About the third type of depression, the non-retarded, non-agitated, or the type we have described as seclusive, we can only get indirect information concerning the valence of the A- and E-tendencies. In studying the intermediate types between extroactive and seclusive depression we find that the same exaggeration of the ego is characteristic even in those patients who display only very rarely. On this basis it is suggestive to conclude that the E-tendency is predominant also in the seclusive depression although it never comes to the surface, just as we have concluded the analogous to be true with the retarded depression.

To summarize what has been brought out about the psychotic personality of the manic-depressive insane, we might say that the clinical evidences have only partly confirmed the expectations we made when accepting the theory of Professor McDougall. A striking opposition was found in the case of manic-depressive depression particularly in the agitated depression, whom these evidences presented as showing apparent egotistical traits. As such according to previous conclusions the depression can not be regarded as characterized by a predominance of the self-submissive instinctive tendency.

There is one point that is strongly suggested by Professor McDougall's discussion of manic-depressive insanity, although I do not feel sure that the author wants to strain it, namely, that the development into a depression being only an exaggeration of features occurring in the cycloid melancholic, is a development that takes place chiefly with people who previous to the psychoses show traits of melancholia, and that the development into a mania, being an exaggeration of features characteristic of the cycloid hypomanic is a development occurring chiefly in people who present hypomanic tendencies. Whether this is the author's view or not it should be pointed out that in reality the matter is not as simple as that. The development spoken of above occurs, it is true, but often other things happen. A person of a timid and rather melancholy type very often goes into a manic excitement, while a very active, rather hypomanic individual might go into a depression. There are no observations from psychiatrists to indicate that such developments as the two latter are less frequent than the former. Besides that, either a melancholic or a hypomanic might develop the circular type of the disorder. I do not venture to give any explanation of what determines the phase in which any normal enters into the psychoses. Hypothetically we have to assume that this is ultimately determined by some agent belonging to the x of the cycloid trait of the individual's constitution.

If we retrospect on the discussion of the personality features of the two phases of manic-depressive disorder we remember that the outstanding feature in both was the egotistical trend. In the manic patient this was paralleled by a sympathetic trend which, however, was less imperative than the egotistic, in the depressed patient we found hardly any evidences of a sympathetic trend. This suggests to us that strong constitutional E-tendencies might further the development in an individual of manic-depressive insanity if these E-tendencies occur in a constitutional cycloid. I might mention that I intend to try to show in another paper that if such strong E-tendencies occur in a constitutional schizoid, they predispose in the same way the development of dementia precox. This undoubtedly gives to the A- and E-tendencies a psychiatric significance of high importance. Our inference concerning this relation may seem to be opposed by the fact that manic-depressive people are said to be prepsychotically, generally of the sympathetic type. If this is a true notion, as I think it is, it can only be explained by an inhibition in these, during the normal period, of the egotistical trend by social or moral influences, as we cannot possibly conceive of a creation of a new fundamental personality trend by the psychoses. These inhibitions which are superimposed on very fundamental constitutional factors will, whenever physical disease, fatigue or any of the agents which by physicians are recognized to form the etiology of manic-depressive insanity, sets in, break down and release the manifestations of the E-tendency. The beginning of this release is offered a beautiful study in the onset of the psychoses, both in the depressed phase which has been described previously and in the manic phase. I suggest that the soundest view of the manic-depressive would be to assume that he is constitutionally furnished with both A- and E-tendencies, the latter being, however, stronger than the former. The existence of the A-tendencies facilitates the inhibition of the E-tendencies by social and moral influences in the prepsychotic period; the breaking down of these inhibitions by fatigue or physical disease allows the E-tendencies to dominate in the psychotic period. It might be of interest in this connection to point out that there seems to be a difference between the manic-depressive and the precox personality in their way of handling the E-tendencies. The former allows them to be inhibited from early childhood, while the latter lets them develop—if thwarted in a compensatory form as in daydreaming. The latter part of this statement might need a modification. In a number of precoxes the prepsychotic history presents what the psychiatrists call a change of personality. It is suggestive to interpret this change as signifying a breaking down of

inhibitions of the E-tendencies of similar kind as the one in the manic depressive. A very marked difference, however, remains, namely, that this breaking down of inhibitions is in the precox, independent of physical disease or fatigue and seems to be due to the growth of the E-tendency itself. This might be considered to imply that in the precox personality, the E-tendency in relation to the A-tendency is more powerful than in the manic-depressive, or to express the matter in other terms, that E-A in the precox is larger than E-A in the manic-depressive. The splitting of the precox in a later development should be referred to the mysterious y of the schizoid make-up. It is only if we do so that we can understand these numerous egotistical day dreamers (artists, etc.) who do not split. They do not split because they are not of the schizoid make-up.

Having recognized the danger of the E-tendency we also understand that its opposite, the A-tendency, is an important constituent of a truly sound make-up. Strong A-tendencies, even in a cycloid, do not lead to insanity even under very distressing physical or mental suffering. The strong capacity of sympathy will always help the sufferer to forget himself in his relation to others. If we thus come to conclude that true sympathy is the only real source of happiness in life we only confirm an opinion that has been expressed by numerous authors of high ideals and high morals.

In the beginning of this paper arguments were promised for the assumption that the germs of altrocentricity and egocentricity were independent in their activity of what constitutes cycloid and schizoid make-up. According to earlier notions the A-tendency should be part of the cycloid, the E-tendency of the schizoid constitution. It is hardly necessary to comment upon the irrelevance of this conception after we have seen that strong E-tendency is one of the constitutional determinants of the manic-depressive psychoses. Further evidences of this independence will be presented in the paper discussing prepsychotic determinants of the reaction type in dementia precox.

In the study of mental disease most psychiatrists strongly feel the necessity to assume innate dispositions in the human being which are more general than the instincts. Thus the psychiatrist recognizes different innate levels of intellectual capacity. These are perhaps by most conceived of as determined by the innate perfection or imperfection of the tool by means of which mind, whatever it is, manifests intellect, namely, the brain. But the psychiatrist also recognizes innate differences in general strength of urge, which he as yet has not been able to correlate with any physical ability or disability. The

conception of the psychopath furthermore involves something innate of still another order than both intellectual level and level of urge.

The assumption made in this paper of innate tendencies for altrocentricity and egocentricity is already suggested by Kretschmer in his conception of the cycloid and the schizoid and by Jung in his original conception of the extrovert and the introvert. The features in which I differ from these two authors is that I separate the A- and E-tendencies from the cycloid and the schizoid and that I consider the tendencies of sympathy and egotism the fundamental traits of altro- and egocentricity and also of extroversion and introversion. Certain reasons for this diverging view have already been brought out and need not to be given anew. The main practical advantage of this differentiation of concepts seems to me to be that it allows a more workable hypothesis of interpretation of functional insanities than the one offered by an assumption of cycloid and schizoid only; and this I think exemplifies a general principle in science, namely, that at a certain stage of our study of complex phenomena the substituting of collective concepts by numbers of analytical ones furthers our understanding of a material.

Finally, I would like to say a few words about how we should understand the relation between the A- and E-tendencies and the instincts.

I suggest that we think of these A- and E-tendencies as an agent which distributes conative energy among the different instincts. While the instincts have rather specific purposes, the A- and E-tendencies have only general purposes in two different directions, the A-tendency in direction of furthering the race, the E-tendency in direction of furthering the individual self. Thus these tendencies are of fundamental biological significance in the widest sense while the instincts have a similar significance in a more individualized sense. Jung has laid partly analogous aspect on the extrovert and the introvert although he does not, as far as I know, attribute to them a censorship over the instincts.

As directors of conative energy into instinctive channels each one of the A- and E-tendencies may favor one or more instincts. Thus the A-tendency might favor such instincts as gregariousness, curiosity, sex and parental instinct and what not. It might even give the self-assertive instinct a somewhat restricted chance and under certain conditions the self-submissive instinct. On the other hand the E-tendency is liable to favor in high degree the self-assertive instinct, while withdrawing entirely energy from the self-submissive instinct.

It also might favor the pugnacity instinct, and in certain instances the gregarious instinct and even the sex instinct although the last two in the perverted purpose of bringing about self-gratification rather than gratification of the race. It might seem paradoxical to ascribe to the E-tendency, the one we have recognized as a-racial, the favoring of the sex instinct but if we accept the distinction Professor McDougall makes between the mating instinct—here called sex instinct—and the parental instinct, as we ought to do, this apparent contradiction disappears. The sex instinct itself is not in its goal altruistic as the parental instinct and might thus very well be favored by the E-tendency. To illustrate this I like to call attention to a chapter in Otto Weininger's famous book, "*Geschlecht und Charakter*," where he divides the human females into what he characterizes as the mother type and the mistress type. The mother who is the truly sympathetic wants the sexual intercourse chiefly as a means of propagation. She possesses the altruistic parental instinct strongly while the sex instinct need not be highly potential. She might even be repulsed by the sex act in itself and after having given birth to her child she might become cold for further sexual approach from the male. The mistress who is definitely egotistic desires the intercourse as a bodily pleasure stimulus, has no urge to propagate, is rather repulsed by the thought of ever having to bear, and will use preventives extensively. She is possessed by the sex instinct and lacks entirely the parental instinct.

The function of the A- and E-tendencies to distribute conative energy into different instinctive channels, manifests itself not only in the normal but perhaps better in the extreme forms when one or other of the tendencies overdevelop in mental disorder. Thus do we for an instance in the manic-depressive manic find an obvious favoring by the E-tendency of the self-assertive and the pugnacity instinct, but this is not all, we also find in many cases a favoring of the curiosity instinct by the A-tendency and of the gregarious and the sex instinct by perhaps both the A- and the E-tendencies. In the depressed phase of the disorder the function of the A- and E-tendencies is equally noticeable. The disfavoring of the gregarious instinct and the curiosity instinct which is marked in non-agitated depressions, the latter often also in the agitated can be referred to the absence of the A-tendency, the favoring of the self-assertive instinct and in certain instances of the pugnacity instinct, which I have claimed is observable in agitated depressions should be explained as due to favoring of them by a potent E-tendency. These last facts seem to me to

suggest that it is not enough to explain the two phases of manic-depressive insanity as due to a predominance in each phase of only one single instinct, the self-assertive and the self-submissive, as Professor McDougall has attempted, but rather to a favoring or disfavoring of a number of instincts and instinctive tendencies by an agent that is more fundamental, namely, the A- and E-tendencies.

Waverley, February, 1926.

THERAPEUTIC RESULTS WITH TRYPARSAMIDE IN THE TREATMENT OF NEUROSYPHILIS

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The Edward Hines, Jr., Hospital was first supplied with tryparsamide through the courtesy of the Rockefeller Institute and Dr. Lorenz in July, 1923. Since that time patients with various forms of syphilis of the central nervous system have been under treatment. Thus far, we have purposely refrained from giving an opinion as to our ideas of the therapeutic value of this drug, because we wished sufficient time to elapse to give us a fairly accurate survey of the situation. Even now we feel that possibly some of our results are more apparent than real. Syphilis of the central nervous system is a chronic insidious disease which, in itself, tends toward bizarre clinical reaction, coupled with unaccountable remissions. These tendencies become even more pronounced under treatment.

In our review of the literature, we believe that the wide divergence of opinions is due, for the most part, to hasty conclusions based on insufficient treatment. In this we agree with Solomon and Viets,(1) who have modified their opinions in regard to tryparsamide during the last year. It is our opinion that favorable results are usually obtained only by intensive and extensive treatment.

The fifty cases we are reporting do not represent the sum total of our experience with the drug; they are those that we feel have been brought to a logical conclusion, viz., received the maximum benefit from treatment. The average number of doses given each patient was twenty-eight, and the average observation period about one year. Certain cases were followed for only a month or two, while others have been hospitalized two and a half years. The cases that were treated for only a short time deteriorated so rapidly that any form of therapy seemed ill-advised. Patients that left our care for extraneous reasons have not been included in this series. We treated general paresis, tabo-paresis, tabes, and cerebrospinal syphilis

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of the endarteritic and meningitic types; also, general paresis with primary optic atrophy. The material was the ordinary kind encountered in a diagnostic psychopathic hospital, and the patients were selected at random. Therefore, these patients were, perhaps, in earlier stages of the disease than those usually found in state hospitals. All were ex-service men, comparatively young individuals, the average age being thirty-two.

There were eighteen cases of general paresis treated. The details of the results are shown in Table I. Five made a social recovery, were discharged, and are at present at work. Four were strikingly improved, but are still hospitalized. Nine were unimproved. Ten of these cases had received previous intravenous salvarsan injections. The average length of hospitalization was ten months for those who made a social recovery or were markedly improved. It is noteworthy that the five recovered cases showed absolutely negative serological results. By this is meant that the spinal fluid had become normal, even as regards globulin content, and that the blood Wassermann remained negative. One of the improved cases showed negative serology, also. The other three showed serological improvement of the Wassermann reaction, the colloidal gold curve, and the cell count. The far-advanced cases did not improve. They were given one or two courses and then transferred to another hospital for institutional care. In the interim the deterioration had become much more pronounced, and at the time of the transfer they were leading a vegetative existence. Cases Nos. 4, 6, 8, 9, 15, 16 and 18 are typical examples of poor results. In determining improvement, we were guided by the clinical picture rather than by the serology. As before said, nine cases resulted in more or less complete clinical remissions; but eleven showed marked serological betterment.

A résumé of the history of Case No. 5 demonstrates a typical recovery. J. S., age thirty-two, entered the hospital May 29, 1923. The onset of mental symptoms was in June, 1922. The patient had been transferred from another government hospital, where he had been given thirty-three injections of salvarsan, combined with mercury and potassium iodide. At time of admission his pupils were typically Argyll-Robertson, there was a slight ptosis of the left upper eyelid and a slight paresis of the right half of the palate; the knee and Achilles reflexes were exaggerated; the abdominals and cremasterics were absent. Mentally, the patient showed a very poor memory for both remote and recent events; he could not retain seven digits and three proper names after three minutes, and had a marked judgment defect. He was mildly euphoric, but quiet and coöperative,

and willing to take treatment, and was therefore assigned to an open ward. There were seven cells per cu. mm., the globulin tests were strongly positive, the colloidal gold gave a paretic curve; but the Wassermann reaction of the patient's spinal fluid, as well as of his blood, was negative. After thirty-two salvarsan injections he had shown no improvement except for the aforementioned negative Wassermann. The records show that both had been four plus. There was no further change in this patient's serological findings after he had been given twenty-four injections of tryparsamide, though at this time there was a decided improvement in the mental and general physical state. He had gained twenty pounds in weight, showed an active interest in his surroundings, the memory showed no defect, and the retention was no longer impaired. He was given ten additional injections, after which the spinal fluid became entirely negative and remained so. The neurological findings remained unchanged. At the time of discharge from the hospital, seven months ago, there was no evidence of a psychosis. He is at work.

The twelve cases of tabo-paresis gave somewhat similar results. Four made complete social recoveries, two were greatly improved, and six unimproved. Three of the cases that made social recoveries finally had a complete negative spinal fluid. Case No. 1, in spite of fifty-six treatments, extending over a period of twenty-one months, still shows positive globulin tests, a colloidal gold reaction suggestive of a luetic zone curve, and a slightly positive Wassermann of the blood and spinal fluid. The average length of treatment for all cases was ten months; fourteen months for those who made social recoveries or improved. Here, as in the general paretic group, the decidedly deteriorated cases grew rapidly worse, and were given one or two courses and then transferred to other hospitals for custodial care. Cases Nos. 2, 3, 6, 9, 10 and 11 of Table II remained unimproved in spite of treatment.

It is more difficult to estimate results in tabes. We have treated only four cases; two are improved and two have remained stationary or progressed slightly. Case No. 3, Table III, was really not a typical case of tabes, but showed symptoms allied to the clinical picture commonly observed in amyotrophic lateral sclerosis. There was, however, a history of syphilitic infection, the Wassermann of the blood and spinal fluid was positive, the cell count was increased, and the globulin reaction was positive. These serological findings remained unchanged after fifty salvarsan injections, used in connection with mercury and potassium iodide, but were promptly reduced to negative after three courses of tryparsamide. He showed

TABLE I
GENERAL PARESIS

No.	Onset of Psychosis	Previous Treatment	Serological Findings					Amount of Treatment (Courses)	Treatment Ended	Serological Results	Clinical Result
			Treatment Began	Cells per Cumm.	Glob-ulin	Colloidal Gold	Sp. Was.	Bl. Was.			
1. A. G.	July, 1921	90 Salv.-Hg.-KI	7-20-23	7	Neg.	0034532000	0	0	3	5-1-24	Recovered
2. M. M.	Dec., 1921	13 Salv.-Hg.-KI	9-4-23	4	Pos.	4443332000	4	0	7	6-8-25	Recovered
3. C. F.	Jan., 1922	33 Salv.-Hg.-KI	9-4-23	7	Pos.	4554321000	4	0	6	2-16-25	Recovered
4. M. D.	Jan., 1922	32 Salv.-Hg.-KI	9-10-23	26	Pos.	4553331000	0	0	1	11-12-23	Unimproved
5. J. R. T.	June, 1923	30 Salv.-Hg.-KI	9-23-23	7	Pos.	5555533200	0	0	4½	10-7-24	Recovered
6. H. T.	July, 1921	10 Salv.-Hg.-KI	10-8-23	11	Pos.	5555554200	4	0	2	4-7-24	Unimproved
7. F. M.	Nov., 1923	9 Salv.-Hg.-KI	1-7-24	23	Pos.	5553544110	4	4	4	2-24-25	Unimproved
8. E. R.	July, 1923	4 Salv.-Hg.-KI	2-18-24	80	Pos.	555555210	4	4	1	4-21-24	Unimproved
9. A. L. T.	Oct., 1921	None	3-6-24	79	Pos.	5555555431	4	0	1	5-7-24	Unimproved
10. C. W.	June, 1920	7 Salv.-Hg.-Tablets	3-17-24	40	Pos.	5554532000	4	0	4	2-24-25	Unimproved
11. G. N.	Dec., 1922	None	3-27-24	60	Pos.	4555532100	4	0	4	3-9-25	Unimproved
12. D. McD.	Dec., 1923	Hg. Rubs	3-27-24	2	Pos.	3455543010	0	0	4	3-16-25	Unimproved
13. L. W.	June, 1920	None	4-21-24	8	Pos.	4443210000	4	4	4	4-13-25	Recovered
14. E. O'B.	Oct., 1924	None	6-6-24	36	Pos.	5555555553	4	4	4	6-8-25	Unimproved
15. J. C.	June, 1924	Continuous Salv.-Hg.-KI-Intraspinal	7-14-24	4	Pos.	5555543000	4	4	1½	11-23-24	Unimproved
16. W. R.	June, 1919	None	9-11-24	22	Pos.	5555433100	4	0	2	2-19-25	Unimproved
17. F. S.	Mar., 1924	None	9-22-24	49	Pos.	5555554310	4	4	3	2-19-25	Unimproved
18. P. D.	Nov., 1924	None	12-8-24	2	Pos.	455431000	4	4	2	5-18-24	Unimproved

TABLE II
TABO-PARESIS

No.	Onset of Psychosis	Previous Treatment	Serological Findings					Amount of Treatment (Courses)	Treatment Ended	Serological Results	Clinical Result
			Treatment Began	Cells per Cumm.	Glob-ulin	Colloidal Gold	Sp. Was.	Bl. Was.			
1. E. S.	Apr., 1921	25 Salv.-Hg.-KI	9-5-23	33	Pos.	4443321000	4	2	7	6-18-25	Recovered
2. K. S.	Aug., 1923	None	9-6-23	20	Pos.	555555441	4	0	1	11-15-23	Unimproved
3. D. W.	Jan., 1920	None	10-25-23	20	Pos.	555555553	4	0	4	8-21-24	Unimproved
4. H. F.	Jan., 1922	None	10-25-23	22	Pos.	555444110	4	0	5	1-12-25	Recovered
5. J. S.	Oct., 1923	None	11-1-23	180	Pos.	555554200	4	1	5	1-12-25	Recovered
6. G. S.	Oct., 1923	2 Salv.	11-9-23	88	Pos.	555554321	4	0	2	4-3-24	Unimproved
7. J. W.	Aug., 1923	4 Salv.-Hg.-KI	3-17-24	120	Pos.	555554321	0	0	4	4-9-25	Recovered
8. O. H.	1922	40 Salv. (Some 15 years ago)	4-10-24	6	Pos.	5555553210	4	6	5	7-21-25	Improved
9. J. P. W.	Jan., 1921	None	4-14-24	290	Pos.	5555555321	4	4	2½	9-18-24	Unimproved
10. C. M.	Apr., 1923	None	4-24-24	67	Pos.	5555543100	4	4	2	10-9-24	Unimproved
11. A. M.	Mar., 1924	None	6-19-24	150	Pos.	5555554200	4	0	3	4-9-25	Unimproved
12. S. G.	Oct., 1923	None	9-15-24	8	Pos.	4555550000	0	0	2	4-16-25	Improved

some slight physical and neurological improvement. Case No. 1 also improved in general health.

It was expected that better results would follow this medication in cerebrospinal lues than had been obtained in the parenchymatous types of neurosyphilis. However, this was not found to be true. Thirteen cases were treated. Ten were of the endarteritic type, and three were of the meningitic type. Three were finally listed as recovered and four as improved. The recovery rate seemed to be a little greater in the meningitic type than in the endarteritic type. One of the three cases of luetic spinal meningitis recovered after eight treatments, and one was strikingly improved after three courses of tryparsamide. The endarteritic type proved disappointing in the final results. Only two cases, Nos. 1 and 5, made a social adjustment. These disappointing results were probably due to the fact that many of the patients had hemiplegias and other outstanding neurological conditions, which were caused by far-reaching damage to the vascular system of the brain. The mesoblastic types, in contrast to the parenchymatous types, were usually in the later stages of the disease. As is well known, the serology in these types is often misleading and the diagnosis was frequently based on the clinical findings, combined with a positive history of syphilis. Seven cases of the entire group improved or recovered. Six remained unimproved. The average age time of treatment for all cases was nine months. Eight had had previous treatment with salvarsan, mercury and potassium iodide, but had shown little, if any, improvement. The details are given in Table IV.

Optic nerve complications resulting from tryparsamide medication have been recorded by a number of authors. For this reason, three cases of primary optic atrophy were treated. At the beginning of treatment sight was practically limited to counting fingers held directly in front of the eyes. These three patients were given, respectively, forty, thirty-two and twenty-four injections of the drug. In two cases the serology improved. The vision, however, remained stationary in each case. About fifteen hundred injections of tryparsamide were given in the treatment of the entire group. Three grams were given as a dose. Five patients, 10 per cent, showed slight transitory toxic amblyopias. This phenomenon usually occurred at the end of the first or the beginning of the second course of treatment. Three patients showed a permanent reduction of vision, the most serious being a reduction to 20/40 in the right eye and 20/30 in the left eye. In one of these three cases the reduction of vision occurred two months after all treatment had ceased. This

TABLE III
TABLES

No.	Onset of Symptoms	Previous Treatment	Serological Findings					Clinical Result
			Treatment Began	Cells per Cumm. ulin	Glob. ulin	Colloidal Gold	Sp. Bl. Was. (Courses)	
1. C. S.	1921	20 Salv.-Hg.-KI	10-15-23	24	Pos.	22331000000	4	Improved
2. C. V.	1919	75 Salv.-Hg.-KI	3-2-24	12	Pos.	0011210000	0	Unimproved
3. E. D.	1921	50 Salv.-Hg.-KI	10-23-24	13	Pos.	0002210000	2	Negative
4. J. K.	1921	16 Salv.-Hg.-KI	12-22-24	0	Neg.	0000000000	0	Unchanged

TABLE IV
CEREBROSPINAL LUES—ENDARTERIC TYPE

No.	Onset of Symptoms	Previous Treatment	Serological Findings					Clinical Result
			Treatment Began	Cells per Cumm. ulin	Glob. ulin	Colloidal Gold	Sp. Bl. Was. (Courses)	
1. M. K.	May, 1922	20 Salv.-Hg.-KI	9-4-23	2	Neg.	1111000000	0	Recovered
2. E. G.	June, 1921	28 Salv.-Hg.-KI	9-6-23	2	Neg.	1112210000	0	Unimproved
3. W. M.	Mar., 1923	None	3-24-24	2	Pos.	1112210000	0	Unimproved
4. G. H.	Nov., 1923	None	4-7-24	7	Pos.	0012210000	0	Unchanged
5. F. B.	June, 1923	17 Salv.-Hg.-KI	4-14-24	63	Pos.	3333332100	0	Negative
6. T. N.	Mar., 1924	7 Salv.-Hg.-KI	5-15-24	36	Pos.	4555321000	4	Improved
7. E. D.	July, 1923	None	7-24-24	36	Pos.	1132221000	4	Unimproved
8. A. F.	May, 1924	Some irregular treatment	10-27-24	88	Pos.	1122100000	4	Improved
9. E. W.	June, 1919	30 Salv.-Hg.-KI	11-24-24	66	Pos.	0012210000	4	Unimproved
10. J. P.	June, 1924	None	12-1-24	6	Pos.	1122100000	0	Improved
MENINGITIC TYPE								
11. E. H.	June, 1920	Some Salv.-Hg.-KI	12-6-23	198	Pos.	0123421000	4	Negative
12. T. B.	Mar., 1919	8 Salv.-Hg.-KI	6-19-24	16	Pos.	1245553211	2	Negative
13. C. H.	May, 1924	None	9-8-24	196	Pos.	0111222000	4	Unimproved

TABLE V
LUE TIC OPTIC ATROPHY

No.	Onset of Symptoms	Previous Treatment	Serological Findings					Clinical Result
			Treatment Began	Cells per Cumm. ulin	Glob. ulin	Colloidal Gold	Sp. Bl. Was. (Courses)	
1. L. C.	1921	8 Salv.-Hg.-KI	9-20-23	2	Neg.	0000000000	0	Serological Results
2. F. C.	1920	None	7-14-24	37	Pos.	1145553211	4	Unchanged
3. W. K.	1918	None	7-21-25	70	Pos.	4555555100	4	Improved

patient was suffering from tabo-paresis, and it is probable that the involvement of vision was due rather to luetic optic atrophy than to the drug. It was necessary to discontinue the drug in only three cases on account of eye changes. Whenever transitory changes were noted, the patients were allowed to rest from two to six weeks and then treatment was resumed. In this phase the advice of the eye department was followed.

There is little to be said of the mode of treatment. It was given in courses, combined with mercury salicylate, as recommended by Lorenz (2) and his associates. We consider the toxicity of the drug as practically negligible. In our opinion it is, however, necessary to be guided by weekly examinations of the fundi and visual fields. Dr. George W. Woodnick, chief of the eye, ear, nose and throat department of this hospital, supervised this part of the work. His suggestions, reports and advice were invaluable. The conclusion was reached that the possibilities of eye complications are not grave. They are outweighed by the therapeutic value of the drug. However, as before stated, it is considered imperative that each case be examined by a competent ophthalmologist after each treatment.

SUMMARY

1. Fifty cases of syphilis of the central nervous system have been treated with tryparsamide.
2. Deteriorated cases are not favorably influenced by the use of the drug.
3. About 50 per cent of our cases improved or recovered.
4. It is usually necessary to give at least three courses before any positive results can be expected.
5. Parenchymatous syphilis of the central nervous system responds to tryparsamide therapy more favorably than the mesoblastic type.
6. Eye complications in properly controlled cases are not of serious import.

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THE PART OF CONDUCT DISORDERS IN THE CONCEPT OF CONSTITUTIONAL PSYCHOPATHIC INFERIORITY ¹

BY J. H. HUDDLESON

OF NEW YORK

We are all familiar with the increase in the insane population, (1) and it is reasonable to assume that the closely related group of constitutional psychopaths has at least increased *pari passu*. Since psychopathic inferiority (2) "frequently represents an aborted form of some one of the more clearly cut psychoses," whatever causes are active toward increasing the psychoses should also increase the psychopathies.

Meyer (3) in 1905 first introduced the term into American psychiatric terminology, as a part of the concept "Psychosis with Constitutional Inferiority," but it rapidly assumed independent importance. Oberndorf (4) in 1912 distinguished the "qualitative" from the "constitutionally quantitative inferior," placing the latter immediately above the high-grade imbecile. Karpas' (5) description of "Constitutional Inferiority" in 1916 excluded intellectual and stressed volitional inferiority, mainly delinquency. Sands (6) in 1923 concurred in this view and concluded that the behavior in "constitutional psychic inferiority" could not be accounted for by an intelligence defect, a psychosis, or a physical disorder.

In a recent survey by the writer, (7) of five hundred cases of constitutional psychopathic inferiority from the Out-Patient Department of Veterans' Hospital No. 81, it was noted that 50 per cent of that number showed well-marked conduct disorders as a part of the symptom-complex. These disorders ranged in intensity from habitual abusiveness to complicity in murder. It is important to keep in mind that conduct disorders *per se* were often adduced specifically as data to justify the diagnosis of constitutional psychopathic inferiority. In one case so diagnosed, no evidence of inferiority other than that of delinquency, appeared in the history.

It is scarcely necessary to prove that such conduct disorders as go to make up the crimes that come to public notice, are increasingly

¹ Read in Section of Neurology and psychiatry. New York Academy Medicine, March 9, 1926.

prevalent. In the study of their etiology, nonmedical men have been turning to the neuropsychiatrists for explanations. These have been forthcoming from several directions. Birth injuries, associated with cerebral pressure and succeeded by uncontrollable irritability, have been postulated, and decompressions performed in an attempt to alter behavior patterns. Endocrine insufficiencies have been worked out, and medicinal or operative attempts to counteract maladjustments among the ductless glands have been strongly recommended by some students of the subject. Schlapp,(8) for instance, makes much of "the relationship between glandular disturbances and criminality." Most recently, epidemic encephalitis has been intensively studied in its etiological relations to certain types of conduct disorders.

On the other hand, constitutional psychopathic inferiority has been considered a fundamentally permanent condition, changeable in some of its aspects through one or another means, but not to be wholly metamorphosed by any procedure. Friedman (9) observes that "It is obvious that constitutional inferiority being in the germ—in the natural composition—of the individual, cannot be cured." Healy (10) recognizes "Psychic Constitutional Inferiority" in "*chronic* (our italics) abnormal social and mental reactions to the ordinary conditions of life, on the part of one who cannot be classified in any of the groups of the insanities, neuroses, or mental defectives." He understands the concept to include only the worst, *i.e.*, the most obstinately criminal, of his cases.

The relative tractability of delinquent tendencies, among all the symptoms taken together, undoubtedly varies with each individual case. There must also be certain of the constitutional psychopaths that are not yet involved in conduct disorders, but whose personalities are such as to make them potential criminals. These individuals, if we may assume a predelinquent stage of their condition, are already part of our neuropsychiatric problem of delinquency as a whole.

A number of the two hundred and fifty cases of constitutional psychopathic inferiority with conduct disorders, in the series already mentioned, were found to have been referred to medical agencies for treatment of the presenting symptoms, *viz.*, the anti-social behavior. Certain Veterans' Bureau beneficiaries charged with various delinquencies, were released by magistrates so far as legal penalties were concerned, to be sent to the Veterans' Hospital or its Out-Patient Department. There they were properly tagged as constitutional psychopathic inferiors, occasionally with the qualification "criminalism," generally without it. These patients were then ordered phototherapy, or hydrotherapy, or some other form of manipulation, and

possibly a not too ill-tasting medicine, but nothing was done toward attempting to convince them of the error of their ways. The same routine procedure can be found in other, probably in all, New York neuropsychiatric clinics to which delinquents may be referred for disposition.

It is far from the writer's intention to belittle the value of physiotherapy or opotherapy; they can be used with excellent effect on various psychoneurotic manifestations, including those superimposed upon constitutional psychopathic states. The point is simply that we as neuropsychiatrists are too prone to reason that the question of penalty has already been answered in the negative before the patient reaches us; if we think of it at all we probably dismiss it as irrelevant to medical treatment. We do, however, recognize that the manifestations of delinquency, and the peculiarities of makeup that support them, are of a different order of mental abnormality from the elements of ordinary psychoses, psychoneuroses, and mental retardation. Is it not reasonable, then, that suggestion as applied to delinquency may be of a rather different order of psychotherapeutics than are those means more commonly used against other symptoms?

Parenthetically, punishment is not so foreign to medical levels as might at first appear. We have but to recall certain methods developed by neuropsychiatrists in the military treatment of war neuroses (11)—a French hospital's *torpillage*, a British casualty clearing station's similar technique, and in England the occasional use of isolation, restricted diet, or severe curtailment of privileges. These are mentioned here as examples of painful or disagreeable forms of suggestion, quite analogous to civil punishment, but definitely ordered or carried out by physicians as such, in the course of treatment for a medicopsychological disease, not at all as penalties ordered by a court-martial. To be sure, under civil conditions, physicians neither possess nor desire to possess the authority necessary for writing or filling a prescription of this nature. They should not, however, be unmindful of the fact that this potent means of suggestion is available, no matter by whom it may be applied: it would still be suggestion whether effected by a medical authority, a legal authority, or a vigilance committee without authority.

The modern attacks of penologists upon penalties, with the perennially popular and recently enthusiastic drives² to bring com-

² The current lay press reports numerous activities such as the following: organized demands for "sunshine in every cell"; ready purchasability of superior to comparatively luxurious food in prison, by means of the funds acquired through the criminal career being penalized; frequency of crimes committed by criminals on bail or on parole; failure to effect appreciable inhibition

fort to the criminal, facilitate his trade, enhance its rewards, and even exalt him as a hero, appear to have gained some reinforcements from medical sources. These forces may be less plausibly appealed to if the neuropsychiatrists' "White Book"—to retain the military metaphor—is resummarized.

Prevention or reduction of conduct disorders as manifestations of constitutional psychopathic inferiority, is as much a neuropsychiatric problem as is the prevention of contractures in hysteria. When all possible reëducative and other milder psychotherapeutic means have been employed, and in some cases finally exhausted, throughout childhood and adolescence, some form of punishment may be viewed as a type of stronger suggestion. Indeed, it may not always be effective; no more so² is the encouragement of poem-writing, or the permission to broadcast song by radio, or the advertisement of a welfare organization featuring protective badges. There undoubtedly is neuropsychiatric opinion in favor of types of suggestion similar to these newer methods; it should be heard. The older suggestive method would probably attract as great a weight of neuropsychiatric authority in its support.

Suggestion through penalty is understandable, of course, as acting not only to deter the individual immediately affected, but also other psychopathic inferiors that are either delinquents or predelinquents. Above all, the failure to assess any punishment for flagrant delinquencies, acts as a powerful suggestion in the opposite direction. It suggests that crime pays.

A parallel may be drawn by referring to the recognizably greater effectiveness of a fixed lump sum and little delay, (12) in compensation for a traumatic neurosis, over regularly repeated payments continued for an indefinite period. The suggestion of these continued payments is toward prolonging rather than terminating the neurosis. The suggestion of suspended sentences and paroles for recidivists is to abolish the fixed and settled certainty of unpleasant effect after cause, and to make it as well worth while for the criminal to continue his

of the business of the criminal "fence"; popular condemnation of a watchman who promptly shot two thieves caught in the act; publication and serious discussion of the merits of obviously mediocre verses by a dangerous capital criminal; public agitation for the early release of a criminal who had been permitted, after imprisonment, to sing through a western radio broadcasting station; entertainment of the ostensibly sober suggestion offered by a certain welfare organization, that citizens should purchase immunity from the criminal profession's attacks by subscribing to this organization and wearing its insignia, in order that the criminals might then prey only upon the non-subscribing public.

practices, as the neurotic is recompensed (in a sense) proportionately to the duration of his flight from reality.

The ideas here presented are by no means novel in themselves, yet it is felt that they have often escaped the attention of physicians. Mindful of the admonition of *primum non nocere*, we have generally disregarded the suggestive value of punishment in well developed adult cases of criminalistic constitutional inferiority, as being outside our peculiar province of endeavor.

The subject cannot be dismissed without a word on accompanying physical disorders. The recognized presence of various deformities, endocrine dysfunctions, and other functional maladjustments, by no means vitiates a diagnosis of constitutional psychopathic inferiority. On the contrary, in a doubtful case they may at times be construed as corroborating the diagnosis. These physical disease processes may be severally treated by any means at one's disposal, and the criminal tendencies may certainly regress, but the fundamental personality makeup is not likely to be changed by plastic surgery on an offending nose to abolish an organ inferiority complex, or by diets and drugs to shift the level of basal metabolism.

In conclusion, we may say that there is nothing mutually exclusive between those manifestations of inferiority (including conduct disorders) that are subject to suggestion, and those other disturbances amenable to medicinal measures or surgical procedures or the mechanical means comprised in physiotherapy. Both groups of symptoms should be treated. Legal penalties of any sort are clearly forms of suggestion, to be recognized as such and urged by the neuropsychiatrist in appropriate cases, when his opinion is sought.

SUMMARY

Disorders of conduct are becoming relatively more prominent in the symptomatology of Constitutional Psychopathic Inferiority as at present understood. Their prophylaxis and treatment, like those of any other symptoms, constitute a neuropsychiatric problem.

Restraint or other legal penalty is itself a form of suggestion or counter-suggestion. Though other agencies are authorized to assess and execute such penalties, neuropsychiatrists can exercise one of their medical functions, viz., promoting public health, by considering the use, abuse, or neglect of these psychotherapeutic means in the same category with other forms of suggestion and with medicinal or surgical treatment.

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POSTENCEPHALITIC RESPIRATORY DISORDERS
REVIEW OF THE SYNDROMY, CASE REPORTS AND DISCUSSION

BY SMITH ELY JELLIFFE, M.D., PH.D.

OF NEW YORK

(Continued from page 44)

Case II

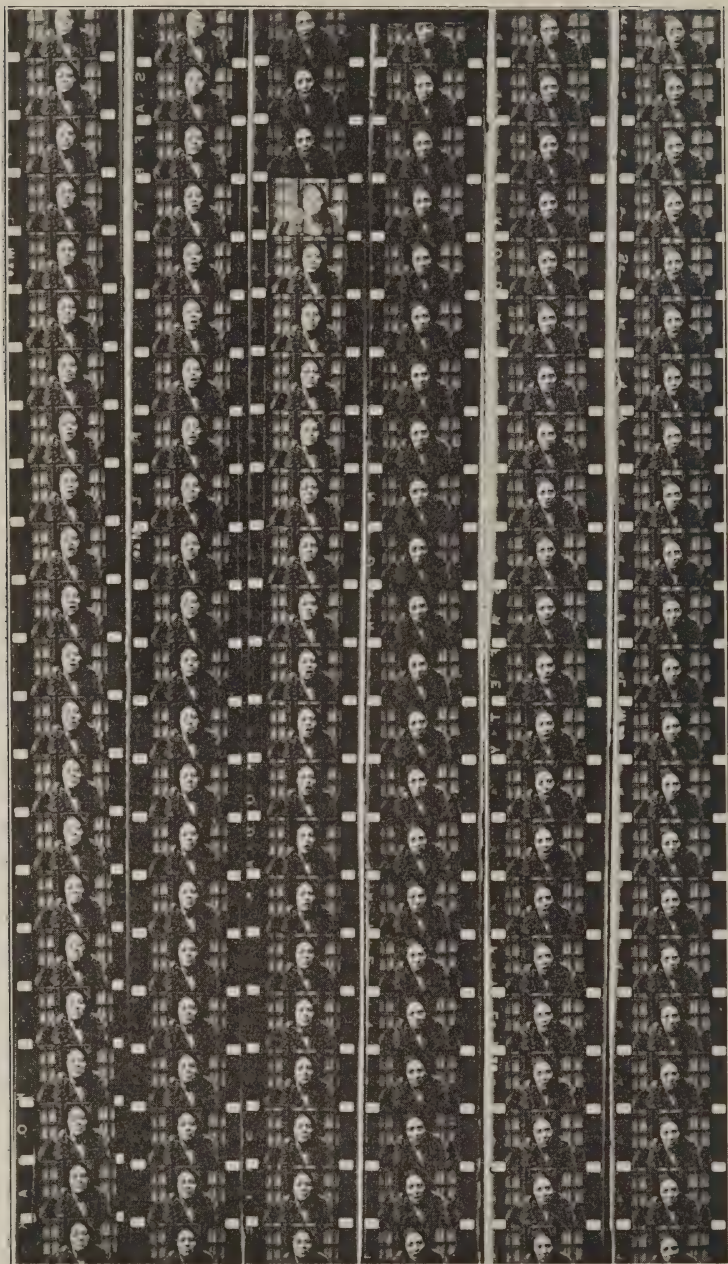
Miss Y. was referred to me on February 8, 1926, by Dr. L. Loeb of Philadelphia through the suggestion of Drs. W. G. Spiller and A. M. Ornsteen of the same city.

At this date she was twenty-six years of age, single. The family history is of interest. The father was born in Germany of Jewish parentage. He has a distinct psychoneurosis, chiefly gastrointestinal in its manifest content. The mother was born in the United States of Jewish parentage. There are three children in the family—a son of thirty-three, married, with two children, reported healthy; a son of thirty-one who had an encephalitis while in the navy serving in the World War and has been psychotic for at least five years, diagnosed as “dementia precox type”; the patient is the youngest child.

There are other family disturbances in addition to the father's neurosis and that already outlined for the brother. Illy defined histories of two psychotic members of the mother's family are indirectly learned of. There is no history of diabetes, goiter, endocrine anomalies, tuberculosis, nor alcoholism on either side thus far obtainable.

Personal history: The patient was normally born, walked and talked at the usual period, read at the age of five to six. She has remained a thumb sucker to the present time, using the middle and ring fingers of the right hand. She had whooping cough at the age of seven months, measles, chickenpox and diphtheria at five. She had no history of infantile enuresis, did bite her finger nails, did not walk in her sleep, but did talk in her sleep. There is no history of stammering or stuttering. There were no other infantile neurotic traits of outstanding character.

She passed fairly well in her studies, went to the third grade in High School by seventeen and went to a business college for a short period. There are no signs of congenital lues, she has never lived in the tropics, suffered any severe accidents, is 5 feet 4½ inches in



CASE 2. Cinematograph film of gasping attacks.

height and now weighs 130 pounds; her weight was 152 pounds four years previously. She has a general pyknic habitus. She began to menstruate at thirteen and one-half years, and has always been regular in this function. She has smoked since about sixteen to seventeen years of age but never excessively; does not always inhale.

History of illness: In December, 1924, she was in excellent health. She was an outdoor girl, enjoyed golfing, motoring, dancing, was popular, made friendships, had healthy social contacts with young men and was engaged to be married when she was taken ill. She was helping a brother during the Christmas holidays in a retail store and was very busy when one night she awakened out of her sleep "in a sort of chill or spasm" as she expressed it and was afraid she was going to be ill. She was at the home of a cousin, used a hot water bag and in spite of herself felt an uncontrollable urge to talk to her cousin. This she did all night long. She narrated all sorts of incidents that were connected with her work at the store in a feverish, turgid manner, connected, but hypomanic in its intensity. Then she began to notice things upon the wall. It seemed to be alive with little black bugs crawling in every direction. These then seemed to cover everything, including herself, her arms, and her chest. This hypomanic state lasted uninterruptedly for about three days, and she was quite solicitous of her condition and made frequent complaints that no one was interested in her and no one would pay any attention to her dire distress.

She then *saw double* and was confined to her bed for about six weeks. During this time everything seemed blurred and confused. She was restless at night but sleepy all during the day time. There were no ascertainable paralyses but she was weak and distressed. She was better by the middle of February and then had a slight relapse. She was always tired and depressed and consulted a local specialist who, according to her story, told her she was "filled with germs" and who started to clean out her gall bladder. This procedure was extremely distressing and after the fourth or fifth treatment she could not stand it any longer and Dr. Loeb was consulted. At this period she was asthenic, emaciated, had a severe leucorrhea, and had attacks of tremor of the entire bodily musculature.

By June, 1925, she was able to lie in bed in the sunshine and then the disordered breathing began. At first she had attacks of rapid breathing four to five times a day. The attacks would last four to five minutes only during which she felt that she was unable to get her breath—"her windpipe was closing on her." She had typical

anxiety attacks, would rush to the window to get her breath in a veritable attack of air hunger. Her appetite was good, but she could not sleep. Hypnotics were then ordered and were used all summer. They were chiefly bromides (Somnos). She saw Dr. Spiller in July



CASE II. Enlarged film studies of mouth movements in gasping breathing. Six of sixteen pictures taken in one second. Read left column downward, then right.

and Dr. Ornsteen later. Her nose seemed to be stopped up and she could not breathe through her nose.

The breathing spells then became more and more frequent and by September of 1925 had become almost continuous. She had fre-

quent crying spells, ungovernable yawning and great prostration. The leucorrhœa became more and more annoying and she used douches to control the itching which was constant. This leucorrhœa had been bothering her off and on for some time.

Regarding this leucorrhœa some notes sent me by Dr. L. in February, 1926, indicated that this was an old difficulty. Dr. L. writes: "Shortly after Miss Y. had entered a school in Boston (1918) she had some abdominal pains. She had an acute salpingo-oöphoritis on the left side—with appendicular involvement as well. The appendix was removed and part of an affected ovary of the right side. Later she had a curettage and adhesions which had caused a uterine displacement after the original operation were relieved. The microscopical examination of the discharge was reported negative."

Dr. L. gave me a summary of her condition at the time of her acute illness. She had the beginnings of an acute exophthalmic goiter with characteristic circulatory disturbances and small tumor. The exophthalmos was bilateral, $l > r$, Stellwag and v. Graefe positive. Pupils sluggish, diplopia, and visual fatigue. There was a fine involuntary tremor which increased on excitement. The patient was talkative and resentful and would talk night and day. Insomnia was marked and was controlled by hypnotics. These Dr. L. emphasizes were the most marked signs of her encephalitis attack. She began to lose weight, and then went through a deep lethargic phase in which she could not be aroused and had a pronounced amnesia for all the events of this period.

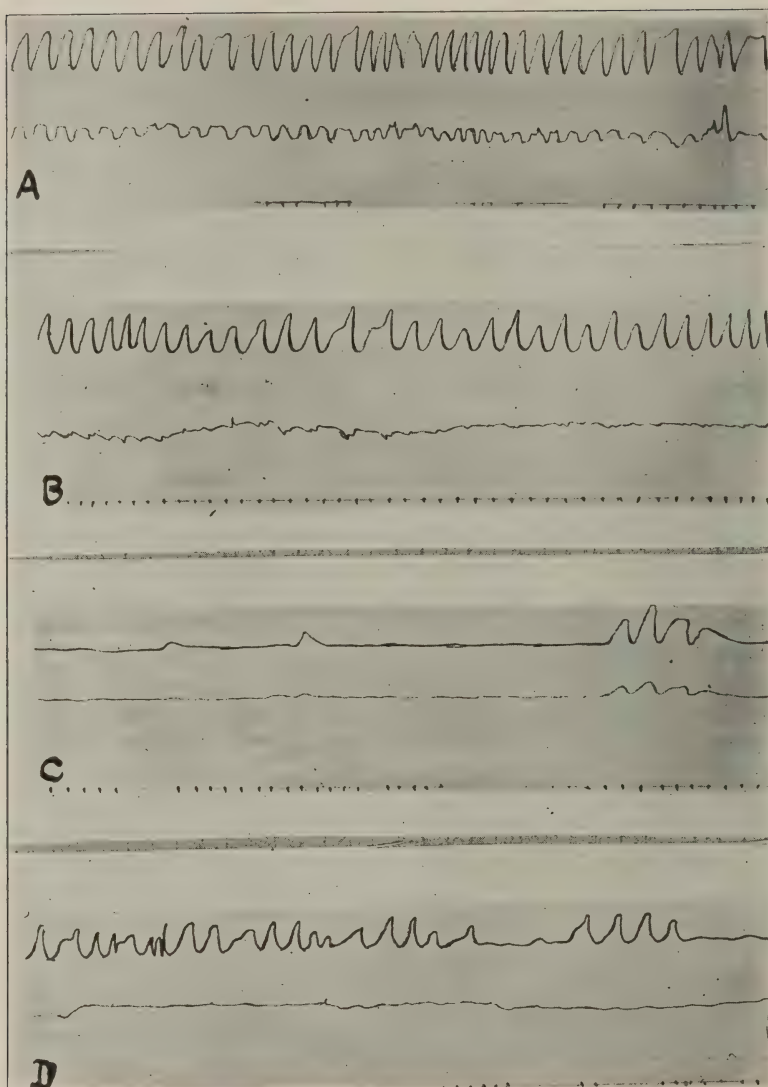
Dr. L. further noted the following:

Three to four months after her recovery from the acute phase she developed the following sequelae.

- (1) True respiratory disorders. Polypnea, bradypnea, apnoea and periodic respiration.
- (2) Respiratory pauses.
- (3) Dyspnea with vasomotor disturbances.
- (4) Inversion of respiratory formula or rhythm.
- (5) Sighs and gaping.
- (6) Abnormal nasal sensations (occasional marked mucous discharge).
- (7) Palpitation and tachycardia are very marked.
- (8) Quite recently she has developed some hysterical phenomena.

My own neurological examination of February 8, 1926, briefly narrated showed the following:

Some nasal grimacing related by patient to her difficulty in breathing but no anosmic or hyperosmic difficulties.



CASE II. Miss Y. A. Phase of tachypnea in which thoracic (upper line) and diaphragmatic (lower line) muscles are synchronously involved.

B. Tachypneic and gasping respirations with irregular diaphragmatic movements. Not myoclonic however.

C. Apneic phase with yawning respirations at end.

D. Irregular yawning and gasping with diaphragmatic dissociation.

Sight O.K. No hemianopsia or fundus changes and no scotomata or restriction of visual fields.

Ocular muscles freely movable, no present diplopia. Pupils equal, slightly sluggish to light, $r=1$.

Trigeminal, facial, auditory and other than vagus nerves O.K. on general examination. No altered oculocardiac reflex. Sialorrhea is profuse, especially at the end of the yawning attacks.

Upper extremities no pareses, nor anesthetics, twitching and marked hypertonus and some rigidity. All arm reflexes + + +. No tremors save after some of the respiratory seizures when the patient had a generalized shivering reaction related to cyanosis, but she says she does not feel cold. No taxes, adiadokokinesia, or sensory defect.

Polyuria and polydipsia are both present. Slight stiffness of parkinsonian type. Patient states she feels as though "strapped to a board" when in bed. Is tense all over. No cogwheel phenomena.

Lower extremities as upper. Increased tonus, partial rigidity, increased patellar and ankle jerks + +, no clonus, no Babinski, Oppenheim, Gordon or Chaddock signs. No sensory disturbances. No gait disturbances but patient has slight propulsion—mild parkinsonism. No trophic disturbances, dermatographia or Sergeant line. Irregular tachycardia, variable, but no murmurs and no pulmonary signs. Larynx O.K.

The *respiratory* disturbance is extreme. It is almost constant. The patient is in extreme exhaustion from her breathing difficulties. She pants for breath as it were.

The attacks are in reality paroxysmal but are so frequent as to seem persistent. As one watches her breathing one is forcibly reminded of a fish gasping for breath. She breathes on the average 35 to 45 times to the minute, the mouth opens, the lower jaw is pulled down, there is a fairly long inspiration and a sharp violent expiration. This goes on for from two to five minutes, then there are several gasps or yawns, and if a long satisfactory yawn is obtained she is over the attack for from two to five to fifteen minutes, but more frequently the yawns are only half satisfying and an apneic phase begins, the lips get bluer and bluer, the chest, and diaphragm (see tracings) are held, the hands have a tendency to clench and she salivates and becomes absorbed in her agonal fixation and after one to two to three minutes commences to gasp again for breath, the color comes back and another gasping respiratory episode is on.

When a deep yawn seems to terminate an attack she can converse and narrate her story or take up any topic brought up. Sometimes these free intervals last five to ten to fifteen minutes. The longest in my office has not been over fifteen minutes although at times she states she has a free interval of an hour.

The breathing attacks cease when she is asleep so far as can be ascertained.

These attacks have been stereotyped now for the three months under observation. I have taken some cinematograph pictures, parts of which are here reproduced. As noted shivering tremors sometimes come on after some of these attacks. Rarely a day goes by without these.

For the first month no restriction was placed upon the use of hypnotics. She continued the use of her hypnotics and begged for something to give her sleep. Her usual sleep was rarely more than two to four hours a day.

The day's program was irregular but was approximately as follows: If she took her hypnotic—she would sleep from 10:30 at night to about 4 in the morning—then the breathing difficulties would begin. She would stay in bed until noon or 2 or 4—get up for a few hours, with slight sleeps in-between and again retire after supper.

Wishing to try out some pharmacological agents I gave her at various intervals, luminal, veronal, tr. hyoscyamus, scopolamine, hyoscine, tr. belladonna. The results were of great theoretical interest but were not of any therapeutic value. At one time a mixture of R. Veronal gm. .02, Tr. Hyoscyamus .01 q. 3 hrs. led to such a profound regression that the patient went almost into a drunken coma after three days medication. She could hardly be aroused and as she expressed it "felt heavenly." She clamored for more. I pushed it a trifle until the patient herself felt a little alarmed. Tr. Belladonna—which A. J. Hall speaks of as being of service, was of no use and scopolamine was worthless.

After three weeks of the drugs she consented to give up all drugs as she realized in a sense what she was after—speaking in terms of "Nirvana"—or the "return to the womb" in psychoanalytic terms, and she realized the significance of her regressive wish—but stated "she was so tired," she welcomed death.

In April, through the courtesy of Professor Twitmyer of the University of Philadelphia I obtained some pneumographic tracings and append his interesting report—and parts of the pneumographic tracing.

The subject was placed in the apparatus at 2:34 p.m. The pneumograph was applied to median frontal body on line of nipples. The lower tambour was placed directly beneath it, the center of the bag about two inches above navel. At that time the subject was undergoing an episode of breathing attacks as evidenced by breathing curves at point "1," and

continuing to point marked "2," at which time it was our opinion that perhaps we were getting the action of the lower intercostal muscles rather than diaphragmatic excursion, so the lower pneumograph was placed on the subject about four to six inches below the navel. Immediately there becomes evident a change in the form of the curve, the establishment of a higher base line probably to be interpreted as due to an involvement of breathing which causes the release of some of the residual air.

At points "3" to "4" a pulse reading was made on the girl and found to be 110, respiration 34 per minute and at the point marked "5" the subject was seated since she objected that she was feeling quite fatigued and the strain of the test was telling on her.

At point marked "6" was the first time that the girl showed any signs of calm and there was a slight cessation of terrific breathing occurring at points "7," "8" and "9."

At point "10" was the first time that we were able to get her quiet and this state we produced by supplying her with a book from which she read silently. Records show that there was a complete apnea, the cessation of breathing showing itself in almost a straight line for both diaphragmatic and intercostal muscles.

At point marked "11," the girl having reached complete exhaustion gasped several times quite audibly.

At point "12," she again resumed an apneic state, compensatory replenishment of breathing in evidence at points "13," "14," "15," "16," etc.

The record was completed at 3:10. The marks at the bottom of the record are the metric swings, the markings being at the rate of 60 per minute.

While my contacts with post-encephalitics has been somewhat restricted nevertheless Miss Y presents an unusual picture inasmuch as her breathing episodes are not accompanied by any mental departures. It has been my experience with previous cases that breathing spells or other mental disturbances seem to run *pari passu* with the respiratory disturbance. However, in her case throughout our examination she maintained a very pleasant and docile attitude. Her sense of humor, her mental alertness and her general behavior are not affected despite the fact that the physiological malfunctioning of the breathing mechanism becomes excessive. At one time she asked us to release the belt about her waist, that it was causing considerable annoyance and preventing her from breathing. Then she said that she would be most happy if she could yawn and relieve herself of the fatigue.

At several times after we had begun our work and when the curves were running quite high she was markedly cyanotic and once or twice rolled her eyes back, eyelids drooping, a spell definitely epileptoid in character. At no time was her conversation incoherent or were there

any other evidences of aberration or hallucination or other abnormality, and no period of unconsciousness unless the transient epileptoid attacks to which we refer are moments of unconsciousness comparable to petit mal. In order to afford a temporary respite from the breathing disturbances I asked her to attempt to vocalize, utilizing some vowel sounds as a medium through which to discharge the breath. This exercise is similar to ones which I employ in orthogenic speech work. This afforded her considerable relief, controlled the breath and momentarily synchronized the movement of intercostal and diaphragmatic musculature..

(To be continued)

SOCIETY PROCEEDINGS

BOSTON SOCIETY OF NEUROLOGY AND PSYCHIATRY

REGULAR MEETING, FEBRUARY 18, 1926. DONALD GREGG, M.D.,
PRESIDENT, IN THE CHAIR

VASCULAR LESIONS IN A CASE OF CHRONIC ENCEPHALITIS LETHARGICA WITH PARKINSON'S SYNDROME

DR. STANLEY COBB

This is a case that I studied in the laboratory of Professor Lhermitte in Paris. The patient was a chauffeur forty-two years of age, who four and a half years before death had fever and diplopia. These symptoms lasted a few weeks, and there gradually developed a rigidity which interfered considerably with his walking and eating. Little by little he became more and more helpless until finally, when he was committed to the Paul Brousse Hospital, he was a perfect picture of Parkinson's syndrome, with rigidity, tremor and movement of the trunk and limbs en bloc; he also showed some interesting sympathetic symptoms;—ruddy face, marked seborrhœa, and conspicuous increase of salivary secretion. Three years after the onset of the disease he became completely bed-ridden and lay rigid without spontaneous movement. He died four and a half years after the onset. Post-mortem examination showed unusual vascular changes which may be summarized as follows: *Cortex*: Marked vascular changes throughout, with increase in number and size of vessels. Great congestion: vessel walls either thin or thickened, hyaline and sclerotic. Hemorrhages in white matter of both motor areas, with iron deposit in hemorrhages and about nearby vessels. Adjacent cellular destruction ascribable to ischemia; also chronic inflammatory changes in frontal and parietal cortex not immediately affected by hemorrhages; slight leptomeningitis; slight marginal gliosis; marked perivascular gliosis. "Mucinlike" bodies in cortex; abundant "amyloid" bodies and intermediate stages. *Basal Ganglia*: On right and left marked chronic cellular degeneration is found throughout, especially of the pallidal cells; more acute changes in putamen, necrotic areas near sclerotic blood vessels, especially in pallidum. Abundant amyloid bodies. Numerous and congested blood vessels, some with thickened and hyaline walls, some thrombosed vessels, others contracted and empty. No hemorrhages. Rings of iron deposited in adventitia of vessel-walls of part of the right pallidum. Perivascular and diffuse gliosis. The most interesting study in these specimens is that of the sections colored with Pearl's iron stain. In the pallidum are found

many blood vessels with dark blue rings of iron in the vessel walls. These are for the most part the vessels mentioned above as having hyaline walls, but a study of the distribution of these iron-ringed vessels shows that they are restricted to the pallidum and for the most part to the inner segment. The hyaline-walled vessels, on the other hand, are found throughout the rhombencephalon and to a less extent in all parts of the brain. A close inspection of these iron-ringed vessels shows that the ferruginous deposit lies in the adventitial layer of the vessel wall, and largely in the newly added adventitia,—the thickening of the vessel resulting from inflammation in the perivascular space. In some cases the iron ring is narrow and lies in a thin layer of connective tissue. In other cases, where the Virchow-Robin space is distended with organized exudate, the iron makes a broad band. Many vessels have hyaline degeneration outside of the thickened adventitia. It is thus seen that the iron lies in the connective tissue beneath the hyaline and outside of the media of the vessel wall. *Mid-brain*: Bilateral depigmentation and degeneration of locus niger. Extensive vascular lesions like those described in basal ganglia. Cellular destruction in left third nucleus. Chronic ependymitis. *Cerebellum*: Degeneration of cells in dentate nucleus, subacute and chronic vascular lesions nearby, surrounded by necrosis. Myelin degeneration in superior peduncles. Vascular lesions in pontile tracts and nuclei, and in one inferior peduncle. *Oblongata*: Perivascular lymphocytosis in somewhat patent Virchow-Robin spaces. Chronic sclerotic changes in vessel walls with surrounding necrosis of tissue, especially near inferior olivary nuclei. *Spinal Cord*: Diffuse peripheral myelin degeneration. Thick-walled blood vessels with some perivascular infiltration. Chronic leptomenigitis. *Dorsal Roots and Ganglia*: Chronic pericellular fibrosis. *Muscle*: Chronic atrophy and fibrosis. *The Skin*: Local hypertrophy of sebaceous glands.

The case is interesting for several reasons. In the first place it has these unusual vascular dilations in the cortex and adjacent white matter which caused hemorrhages and perhaps death. Also the finding of iron deposits in the adventitial spaces of these vessels may indicate that iron, as a product of degeneration, is carried to vessel walls in the pallidum. This deposit of iron in the vessel walls, however, is apparently so common that one should look on it as normal (Hurst—*Jour. Path. & Bact.* 1925; 19, 65) and relative to the high iron content of the globus pallidus. The sclerotic and hyaline changes in the vessel walls are distinctly abnormal; the cell destruction is marked; and there is lack of pigment in the substantia nigra; all typical pathological findings in "post-encephalitic Parkinsonism." Cases such as these make us realize what a chronic course epidemic encephalitis may run, and what great damage to blood vessels occurs. How often this may eventually lead to cerebral hemorrhage remains to be seen, but I may venture to predict that many recovered cases of epidemic encephalitis will have vascular accidents at an early age.

Discussion: Dr. Donald J. MacPherson: There are three striking things about the pathological changes in encephalitis which has

produced the Parkinsonian syndrome. First, there are always multiple lesions; second, both chronic and acute lesions occur at the same time. This is of particular importance because the virus is of the type that can lie dormant in the nervous system for a long period of time. In London they are beginning to see cases first showing onset of Parkinsonian syndrome five years after the original attack of encephalitis. Third, there are almost constant lesions in the substantia nigra. Whether this lesion is essential for the Parkinsonian state is a question, because it is always associated with other lesions. It would seem more probable that we are dealing with an injury to the extrapyramidal system, and that a lesion either in the globus pallidus or its projection system can produce the symptomatology. It does seem, however, that the globus pallidus is peculiarly susceptible to the virus of encephalitis.

Dr. E. W. Taylor: Is there any special lesion in the lenticular nucleus? Or do you attribute the symptoms to lesions lower down?

Dr. Cobb: I am not sure. We have had lesions in the pallidum, and these iron rings were in that region only. They often arise there in normals and with various inflammations; so they are not especially specific. The unusual condition is these hemorrhages. I should be interested to know if any one else has had experience with these small multiple hemorrhages.

Dr. H. R. Viets: One question about the cause of death of encephalitis patients. They die of hemorrhage of the brain, but they do not die, in my experience, an apoplectic death. They have small multiple hemorrhages scattered diffusely throughout the brain, not a single ruptured vessel. We have recently seen a case of three years' duration with typical onset, followed by a long period of slight but definite lethargic attacks, who died within a week of an ascending paralysis, not apoplectic in type. At autopsy small hemorrhages were found in both the medulla and the brain. Do any cases of encephalitis die an apoplectic death?

Dr. Cobb: They are almost all small scattered hemorrhages.

Dr. MacPherson: It is interesting to note the apoplectic form of hemorrhage in this disease. Collier reported four cases where the illness was initiated by a stroke (so-called), and it was evident from the symptomatology that developed that the disease was encephalitis lethargica.

Dr. Donald Gregg: Is there any way to tell when the encephalitic process is completely ended? A normal spinal fluid finding seems to show at least a quiescent or dormant period. Am I correct in inferring that even when a normal fluid is found it is to be expected that the process will probably continue, although there may seem to be a temporary remission?

Dr. Cobb: The only answer I can make is that this individual had subacute inflammation in the hind brain and chronic scars elsewhere. He had been sick about four and a half years; he had lesions in all stages. The infection was evidently active in a mild way over all those years. There was nothing reported in the spinal fluid.

THE EFFECT OF CONSTITUTIONAL FACTORS IN INFLAMMATORY REACTIONS IN THE NERVOUS SYSTEM

DR. D. J. MACPHERSON

In investigating the variables that influence cellular reaction in the nervous system, an attempt was made to study the effect of altering the environment (in the sense of body fluids and hormones) in the presence of a constant stimulus. Guinea-pigs and rats were the animals used, and an incision into the cortex of the brain under aseptic precautions the lesion studied. All animals were killed by ether nine days following operation. Four series were studied: Normal adults, animals receiving *aqua amygdalarum amararum*, animals receiving phenylhydrazin, and rats from which the thyroid gland was removed by cauterization.

In studying the serial sections, the normal animals showed a marked proliferation of the connective tissue growing deep into the incision. There was also proliferation of the connective tissue cells from the neighboring blood vessels. On the margin of the incision were large numbers of cells of the lymphocytic series and a few gitter cells. There was some swelling of the ganglion cells in the neighborhood of the lesion, with numerous trabant cells, increase in the glial nuclei in the surrounding tissue, and some indication of a beginning increase in glial fibrils.

In the animals treated with *aqua amygdalarum amararum*, the proliferation of the pia and ingrowth of the connective tissue cells in the incision was much less marked than in the normal. There were almost no cells of the lymphocytic series present. There was a more severe and extensive degeneration of ganglion cells; but instead of the trabant cells and increase of the glial nuclei, there were numerous giant glial cells of the amoeboid type found in the intervening tissues.

In the animals treated with phenylhydrazin, there was an excessive proliferation of connective tissue exceeding the normal. A moderate number of lymphocytes were present. Again there was marked degeneration of ganglion cells, but almost no glial reaction, and only a rare amoeboid form. An interesting associated finding in these animals was a marked internal hydrocephalus. The control brains in the phenylhydrazin series showed marked hyperaemia, with an occasional petechial hemorrhage, but no lymphocytic reaction.

Of the rats developing myxedema, only one survived the operation. This animal showed a marked pial proliferation with but little ingrowth into the incision. There were more gitter cells present and slight lymphocytic reaction, severe degeneration of the ganglion cells, and only slight reaction of the glia.

The indications from this series of experiments were that connective tissue is the most resistant tissue present in the nervous system; the failure of the glial reaction varied in the other series, the most severe toxic action apparently taking place in the animals treated with *aqua amygdalarum amararum*. Whether these reactions were due to diminished oxygen in the blood in the one case, to anaemia in the second, or to the myxedematous condition in the third, or to a

direct toxic action on the tissue itself, it is impossible to determine by these experiments. It is to be noted, however, that the constitutional factors played a marked rôle in the pathological picture as presented to the microscope.

Discussion: Dr. E. W. Taylor: Can you draw any general conclusions as to inflammation?

Dr. MacPherson: I think it is very difficult, in such a small series, to draw any general conclusions. It was more of an orienting study. We were merely trying to find out if it was possible to influence the cellular reaction by factors other than those due to the disease itself. Apparently that is possible. The chief point is that the connective tissue is much more resistant than the glia, and that the lymphocytic picture varies tremendously in the series studied.

ON THE NATURE OF THE CEREBROSPINAL FLUID*

FRANK FREMONT-SMITH, M.D.

The important evidence regarding the points of origin and absorption, and the mechanism of absorption of the cerebrospinal fluid is reviewed. It may be accepted as established that the choroid plexus is the chief source of the cerebrospinal fluid, and that absorption takes place chiefly through the arachnoid villi into the venous sinuses. There is also good evidence that the mechanism of absorption is determined by the relative hydrostatic and osmotic pressures of the cerebrospinal fluid and the blood in the dural sinuses.

The direct evidence for the secretion theory rests upon morphological cell changes in the choroid plexus. These changes are exactly opposite to those seen in actively secreting glands. The cell changes regularly accompany any increase in the formation of fluid and may be regarded as evidence of such increased formation. They in no way indicate active secretion and are as readily interpreted as evidence for dialysis.

The cerebrospinal fluid pressure is normally higher than the cerebral venous pressure, and varies directly with the capillary pressure in the choroid plexus, excepting when the osmotic pressure of the plasma is changed. If this osmotic pressure is diminished the spinal fluid pressure increases, while if the plasma be made hypertonic the fluid pressure will fall, and the flow through the choroid plexus appears to be reversed.

The analogy between cerebrospinal fluid and the aqueous humor of the eye is emphasized.

In comparing the chemical contents of the plasma and cerebrospinal fluid, the striking contrast lies in the protein, which is almost absent from the cerebrospinal fluid, and the chlorides which are present in much higher concentration in the cerebrospinal fluid than in the plasma.

Mestrezat showed that the osmotic pressure of the plasma and

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cerebrospinal fluid are identical. The experiments in which he reproduced cerebrospinal fluid by dialysis from plasma and also from the peritoneal cavity are discussed and their significance emphasized.

The author's results, in collaboration with Miss M. E. Dailey, show that a relationship exists between the concentration of protein in the plasma and the distribution of chlorides between plasma and cerebrospinal fluid,—analogous to the equilibrium between plasma and pleural or ascitic fluids described by Loeb, Achtley and Palmer, and to that between plasma and red blood cells, studied by Van Slyke, Wu and McLean. The Donnan membrane-equilibrium appears to play a significant rôle in these relationships.

The similarity, in chemical composition, of the cerebrospinal fluid to the glomerular filtrate of the frog, recently described by Wearn and Richards, is pointed out.

An analogy is suggested between the cerebrospinal fluid and that protein-free fluid which, in many parts of the body, is believed to be continuously filtered from the arterial side of the capillaries into the tissue spaces and reabsorbed by the venous side.

An explanation is offered for the development of internal hydrocephalus on the basis of hydrostatic and osmotic pressures.

It is concluded that there is no good evidence for the secretion of cerebrospinal fluid; that the evidence, taken as a whole, is overwhelmingly in favor of dialysis; and that the laws which determine the simple membrane-equilibrium existing between plasma and cerebrospinal fluid have fundamental significance for the mechanism of fluid exchange in the organism.

Discussion: Dr. L. J. Henderson: This paper seems to be entirely satisfactory. The results, no doubt, will be modified in time because they will have to be extended and because the theories of physical chemistry are likely to change; but I have no criticism whatever to present on the conclusions that have been reached. It seems to me they afford sound and promising working hypotheses, and in the main they are likely to stand as the true interpretation of the phenomena. Evidently it is out of the question for me to undertake to tell you anything about the neurological problems. Perhaps it would be interesting for me to say a word about this type of physical chemistry and its bearing on medicine. The reason why these things are interesting, fundamentally interesting, is because beneath the structures of the histologists there are the physico-chemical structures. The processes which go on in these are the very foundation of all organic activity. First of all, the body is made of water, not pure water, but water containing a collection of salts, acids and bases, and then the proteins. If we had perfect understanding of all the physico-chemical relations and interrelations between these things, we should be going very far toward a thorough foundation of general physiology. The reason is that here, as in the field where the engineer works, a description is also an interpretation of things. When you understand the structure of the physico-chemical system you understand the function of it. Here where you have a clear interpretation of what things are you see the relations and you see how they work.

Not only is that true, but it is also true that as you pass on in the direction in which Dr. Fremont-Smith has been going you come to understand the relations between the physico-chemical phenomena and the phenomena that deal with slightly larger structures, and so you make the connection between physico-chemical phenomena and the other better known phenomena on a larger scale; and in time the circulation in general, the properties of blood pressure, etc., are seen in their organic unity. In the process that takes place in the formation of the cerebrospinal fluid, dislysis is evidently of first importance. It would be very unreasonable to suppose that the organism goes to the trouble to construct this apparatus and that it then does things in a roundabout way that can take place spontaneously. It may be that there are slight modifications of the simple physical phenomenon which may arise because of peculiarities of the membrane. We are now on the verge of a development in physiology involving the properties of blood, the laws of the circulation and the laws of diffusion, which is destined to go beyond a mere physical or chemical or physico-chemical analysis. Claude Bernard saw that such is the task of physiology, but he was not understood in his day and few have understood him since. It will soon be possible for us to see the interconnections between more and more of the phenomena that have been studied as separate phenomena, as belonging to chapters of physiology. You have had an illustration tonight that in order to understand the formation of cerebrospinal fluid it is necessary to have a clear appreciation of the nature of blood, of dialysis, and of a great many other processes. The facts have been reduced to quantitative formulation.—However difficult it may be to understand for the first time such units, once learned they will afford an enormous saving of labor.

Dr. J. C. Whitehorn: Has Dr. Fremont-Smith encountered any spinal fluid chlorides considerably higher than the normal range? If so, what were the plasma proteins? Secondly, the interpretation of the effect of protein as analogous to a Donnan equilibrium suggests that the albumen of the plasma may be of greater importance than the globulin. Is there any evidence indicating such a difference in effect on the chlorides of the cerebrospinal fluid?

Dr. Fremont-Smith: We have had very few cases with spinal fluid chlorides higher than 750 mgm. per 100 c.c. In these the plasma chlorides were also elevated, while the plasma proteins were within normal limits. We have had no case with plasma proteins much above 8%. Theoretical considerations would lead us to expect a greater "Donnan effect" from the albumen than the globulin of the plasma, as Dr. Whitehorn suggests. We have not sufficient data as yet to draw conclusions in regard to this point.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Meyer, A. W., and Cajori, F. A. UNIQUE CASE OF MYELOMA. [Arch. Internal Med., May, 1924; J. A. M. A.]

In the case cited by Meyer and Cajori, the patient, aged sixty-eight, died of bronchopneumonia. In the clinical diagnosis, the presence of arteriosclerosis, bronchial asthma and chronic hypertrophic arthritis were noted. It probably is significant that 3 per cent of albumin was present in the urine, and possibly also that the patient stated that he had "sciatica" all over his body for years. His chief complaint on admission was shortness of breath on exertion, the duration of which he could not recall. The arthritis deformans was said to have begun fourteen years before. There was a history of syphilis. The necropsy showed numerous fractures, fairly marked scleroses, calcareous deposits and evidences of periostitis in the form of roughenings of the external surface of a number of bones. The spleen was very small, weighing only 104 gm., and the uniqueness of the case lay in the peculiar deposits in many of the articular cartilages and the extensive urate deposits in the subcutaneous tissues and in some of the injured tendons. Innumerable, distinct, tumors were present everywhere in the skeleton. They proved to be myelomas.

Lewin, Philip, and Jenkinson, Edward. CHONDROGENESIS IMPERFECTA-ACHONDROPLASIA-CHONDRODYSTROPHIA FETALIS. [Am. Jl. Roent. & Radium Ther., Vol. XI, Feb.]

A midget is a man or woman looked at through the wrong end of the opera glass, that is, diminutive but not deformed. Dwarfism (chondrodystrophia fetalis) is a condition of abnormal fetal development of cartilage. It occurs in lower animals also. The most probable theory of its etiology is that of Jansen, *i.e.*, that a small amnion increases the normal embryonic infolding and hydrostatic pressure during the fifth or sixth week of fetal life, resulting in feebleness of growth of the rapidly growing cartilage cells. The cardinal sign is the disproportion between the normal length of body and the short extremities. There is an excess of skin and fat in folds, "pugnose," and the hands are short and chubby with fingers of nearly equal length coming off the metacarpals like spokes of a wheel. Prominent abdomen and exaggerated lumbar lordosis are almost constant. The roentgenologic evidence is most marked in the

epiphyses and epiphyseal cartilages, especially of the long bones. The periosteum seems to show no change. [Author's abstract.]

Leontjewa. CHANGES IN BONES IN SCLERODERMA. [Arch. f. Klin. Chir., Vol. XIII.]

Leontjewa reviews 200 cases from the literature of changes in bones and joints as corollary to scleroderma. She assumes that glandular disorder must also play a rôle, because in one case hypotonia, asthenia and pigmentation were suggestive of suprarenal hypofunction, while polyuria suggested a pituitary origin. However, this disorder may possibly be merely one single group of symptoms in a higher pathologic entity—a general predisposition, not fully understood as yet.

Garrod, A. and Evans, G. ARTHROPATHIA PSORIATICA. [Quart. Jl. Med., Jan., 1924.]

Three classical examples of the association of psoriasis and arthritis are here reported. In one case there was a history of trauma; in two there was pronounced menstrual disturbance. Intermittent hydrarthrosis occurred to two cases. [No inkling of the psychical situations. Ed.]

Wyllie, W. G. OCCURRENCE IN OSTEITIS DEFORMANS OF LESIONS OF CENTRAL NERVOUS SYSTEM. REPORT OF FOUR CASES. [Brain, Vol. XLVI, Oct. J. A. M. A.]

Wyllie reports two cases of compression of the spinal cord in patients suffering from osteitis deformans, and two cases of atrophy of the optic nerves in patients whose skull was affected by osteitis deformans. In both cases diplopia also occurred, indicating most probably an injury of one or more of the ocular nerves. Several of the long bones were involved in one of these cases, and the vertebral column in the other.

Krabbe, Knud H. ACHONDROPLASIA AND PSEUDO-ACHONDROPLASTIC CASES. [Revue neurlogique, Vol. XXX.]

We find in the literature description of cases which are called partial or atypical achondroplasia. These cases are resembling the true achondroplasia concerning the shortness of the extremities, but they are different in that the indent of the nose-root always is absent, sometimes also the "main en trident." Some of these cases are of postnatal origin, appeared after infectious diseases or complicated with rickets. Author gives description of two such cases of pseudoachondroplastic syndrome. In both cases the indent of the nose is absent. In the first case the disease has begun at the age of six years after an acute disease. In the second case the hands and fingers are normal, not achondroplastic. Such cases must not be considered as true achondroplasia, it is other diseases which present a certain resemblance with the true achondroplasia but have another origin and possibly have some connection with rachitis.

Disturbances of the endocrine glands, especially pubertas precox,

seems to be able to produce by advanced fermature of the epiphyseal lines a shortening of the extremities that may produce a certain resemblance to achondroplasia. But there is no reason to suggest that the true achondroplasia belongs to endocrine disturbances.

There have been described cases of heredofamilial micromelies in which the micromelia is limited to the hands so that these present an aspect as the "main en trident." Author describes such a case. It is possible but not certain that such cases must be considered as partial achondroplasia.

The true fetal achondroplasia must be considered as a heredofamilial abiotrophy, in which the abiotrophic process is localized to the epiphyseal lines. It must be sharply separated from the here described cases of pseudoachondroplasia. [Author's abstract.]

Moore, S. OSTEITIS DEFORMANS. [Am. Jl. of Roent. & Rad. Ther., Vol. X, July.]

Paget's disease should be investigated more thoroughly than it has been according to the author. There might be uncovered bone functions other than the rather passive ones of support and the housing of blood-forming organs.

Hirsch, S. CHRONIC DEFORMING ARTHRITIS. [Klin. Woch., June 4, 1923. J. A. M. A.]

Hirsch has observed 150 cases of arthritis deformans since 1919, while he encountered only fourteen in the years 1900-1917. A similar phenomenon is the increased frequency of osteopathies. Many cases are developing unilaterally. This depends on static and dynamic factors. The deformations appear at the points of least resistance. He suspects a tuberculous etiology in a large proportion of the cases of arthritis of obscure origin. Removal of diseased tonsils had beneficial effects only in cases of acute rheumatism. It is however indicated for prophylaxis. Exact differentiation between the forms of chronic arthritis is impossible.

Galvin, A. H. OSTEITIS FIBROSA CYSTICA OCCURRING IN A FLAT BONE. [Calif. State Jl. of Med., Vol. XXI, June.]

In reviewing the literature Galvin finds that bone cysts show a predilection for the long bones, particularly the femur and humerus. He reports an unusual case of cyst occurring in a flat bone. Two and one-half years before examination the patient had received a rather hard blow on the left lower jaw. There was no pain at the time, and injury was not apparent except that the jaw would drop when in certain positions. One year later the jaw began to swell and there was slight soreness but no actual pain. When the patient presented himself for examination there was a hard tumor measuring $5 \times 3\frac{1}{2}$ cm. in the region of the angle of the left jaw, neither red nor tender. The tumor extended forward to the mental foramen and upward to about middle of the ramus.

Motion of the jaw was not restricted, and there was no glandular enlargement. The roentgenograms showed a cystic formation in the bone in which could be seen an inverted third molar. At operation the cortex of the bone over the tumor was found to be very thin. It broke down after the skin was incised, and the cavity was found to be filled with a brown serous fluid. All cysts were broken down and a transplant from the tibia was inserted, reaching from the angle of the jaw to the anterior border of the cyst wall. The wound healed by first intention. After operation the patient had no pain, no restriction of motion, and the cortex of the bone over the original tumor was firm. [Author's abstract.]

2. ENDOCRINOPATHIES.

Lieb, C. C., Hyman, H. T., and Kessel, L. A STUDY OF EXOPHTHALMIC GOITER AND THE VEGETATIVE NERVOUS SYSTEM. [J. A. M. A., Vol. LXXIX, Sept. 30.]

This study predicates that the autonomic imbalance presents all the symptoms of exophthalmic goiter with the single exception of increased basal metabolism. The majority of patients presenting exophthalmic goiter give a history, past or present, of autonomic imbalance. The actual transition from autonomic imbalance to exophthalmic goiter has been observed. The transition is characterized by an augmentation of the symptoms of autonomic imbalance plus a metabolic upset, as evidenced by an elevated basal metabolism. Though thyroid enlargement and autonomic imbalance may be present independently, their frequent association is probably more than a mere coincidence. The causative relation between these has not yet been determined, but it seems improbable to the authors that thyroid hyperplasia is the cause of the imbalance. Only one therapeutic suggestion is offered, namely, the use of atropin in disturbances of the bulbo-sacral division of the involuntary nervous system. Whether tonus is increased or decreased, atropin may be employed. If the tonus is low, small doses are indicated; they stimulate the center without affecting the nerve endings. If the tonus is high, large doses paralyze the endings and nullify the excessive central action.

Hildebrandt, F. THE EFFECTS OF THYROXIN AND IODIDES ON METABOLISM. [Therap. d. Gegen., XXIV, 363.]

The author found that the feeding of thyroid extract to rats causes a loss of weight, an increase in O-consumption and a decrease in the respiratory quotient. Since there is no augmentation of urinary nitrogen, the decreased respiratory quotient is interpreted as an indication of increased oxidation of fat. The intravenous injection of thyroxin causes identical changes in metabolism and the author agrees with Kendall in regarding thyroxin as the active principle of the thyroid gland. Thyroxin contains about 66 per cent of iodine and it occurred to the author that the alterations

in metabolism might be due to the splitting off of free iodine; accordingly, the effects of iodine, in the form of potassium iodide and in amounts equivalent to that contained in thyroxine, were determined and were found to be the same as those following thyroid feeding or thyroxine injection. The intravenous injection of potassium iodide into rats fed on thyroid stopped the loss of weight and flattened the gradient of O-consumption; in some cases there was gain in weight and decrease in oxygen intake. These experiments confirm the clinical findings that minimal doses of iodine lessen the metabolic upset of "hyperthyroidism." If large doses of potassium iodide are injected into thyroid fed rats, the loss of weight and the O-consumption are greatly exaggerated, a reaction that finds its counterpart in the distinctly harmful effects of large doses of iodides in "hyperthyroidism." Further experiments showed that the response to potassium iodide is not altered by thyroidectomy and the conclusion is drawn that the metabolic changes cannot be due to an action of potassium iodide on the cells of the thyroid glands. By a process of exclusion, the author is forced to conclude that the metabolic changes are due to a specific action of iodine on all the cells of the organism.

Guilder, R. P. INCIDENCE OF GOITER IN COLLEGE STUDENTS (WOMEN).
[Annals of Clinical Medicine, I, No. 4, p. 238.]

Statistics on the incidence of goiter in the state of Illinois are here presented, as estimated from its occurrence among the women students of the class of 1924 at the University of Illinois in Urbana. Endemic goiter is found in all parts of the world, but particularly in mountainous districts. It is most prevalent in temperate and subtropical zones, although it has been known to occur in very cold regions, and in the tropics as well. Smith examined 65,507 men between the ages of eighteen and twenty-one years, passing through the Jefferson barracks (Missouri), from April to September, 1918, and found thyroid enlargement in 1074 cases (1.63 per cent). In 116 cases toxic symptoms were present. These men were from fifteen states. The highest percentages of goiter were found in the case of men from Oklahoma, Texas, Tennessee, Nebraska, North Dakota, and Indiana, in the order named. The highest percentages for toxic symptoms were in the case of men from Texas, North Dakota, Kansas, Wisconsin, and Tennessee, in the order named. The percentage was lowest for the states bordering the Great Lakes. In general, the Atlantic states, except western New York and Pennsylvania, and the Gulf states, exclusive of Texas, present a lower incidence than do the middle western and western states.

In groups of school children goiter appeared to be a little more than twice as frequent in girls as in boys. Most of these children were below the age of puberty. After puberty the condition is known to be five or six times as common in girls. An examination of the incidence of goiter among university students, both men and women, revealed a high degree of inci-

dence in the Great Lakes region. The highest percentage was in the case of the University of Illinois, the figures decreasing in the following order: Ohio, Wisconsin, Michigan, Washington state, California, and Wellesley College. At the University of Illinois 45.3 per cent of the women students in the class of 1924 presented thyroid enlargement. Of the 276 cases, the gland was slightly palpable in 100, palpable in 86, middle lobe slightly palpable in 38, right lobe slightly palpable in 8, left lobe slightly palpable in 1; the degree was not stated in the other 43 cases. The greatest incidence was found among the youngest students, the highest percentage being 66.6 at the age of sixteen years. The lowest percentages were found after the age of twenty-seven years. In the majority of cases no subjective symptoms were present at the time of examination. Tremor was the chief manifestation; this was present in twenty-six instances; moisture of the palms was noted in five cases. Of the total number of students examined (609), 72 per cent had lived in Illinois during their entire childhood; 27.9 per cent had lived in other states or foreign countries during childhood. Of the 276 who had enlarged thyroids, 72.1 per cent had lived in Illinois, and 27.9 per cent in other regions. Of the total number of students who had spent their childhood in Cook County, 55 per cent had enlarged thyroid glands.

The actual cause of endemic goiter is still unknown. Most authorities agree that it is due to iodine deficiency dependent upon some environmental conditions, such as soil, rock formation, or water supply. The toxic agent has also been considered to be a contagium vivum conveyed by water, and contained in certain soils. Bircher has concluded that an organism producing a toxic substance of a colloid nature is imparted to water of goiterous districts by certain soils, the colloid substance producing the goiter. It is probable, however, that other factors also play a part. Deficiency of iodine in the diet, and other food deficiencies, may be causative. Blankinship has found thyroid enlargement during the course of acute and chronic infections, and when the metabolic regulating function of the gland has been overworked. Goiter has also been interpreted as a deficiency disease, consequent to overcrowding, poor sanitation, overwork, and worry. Brooks has found the condition to be especially common to the more emotional races, the Hebrews, Italians, and Irish; the negroes exhibit the lowest incidence. There also appears to be an hereditary factor involved. This may be due to placental transference of the causative agent from mother to fetus. Such fetal thyroid enlargement tends to disappear in from seven to fourteen days after birth, regardless of whether or not the mother nurses the infant. Apparently, therefore, the causative substance is transmitted by way of the placenta, and not of the mammary secretion. Of the 276 cases of thyroid enlargement in the University of Illinois, the condition was also present in the case of the mother in twenty-three cases, of the sister in twelve, of the aunt in eight, of the grandmother in two, and there was a familial tendency in two.

Fischer. THE X-RAY TREATMENT OF GRAVES' DISEASE. [Ugeskrift for Laeger, April 13 and 20, 1922.]

Four hundred and ninety cases of Graves' disease have been treated by this author with the X-rays, and has effected either recovery or definite improvement in about four-fifths of the total. In the remaining fifth no harm was done, and in the one case in which death occurred six days after an exposure this could certainly not be held responsible. The results were much better in the author's private practice than among his hospital patients, many of whom relapsed because they could not avoid overwork and worry. Only eleven patients were males, and the average age of the females was between thirty and forty-five. Particularly good results were obtained in early or abortive forms with marked nervous symptoms and only slight tachycardia, whereas the results were rather disappointing when the clinical picture was dominated by tachycardia and the enlargement of the thyroid and the nervous symptoms were slight. The author pleads for X-ray treatment at an early stage, and is convinced that it does not interfere with subsequent operative treatment by provoking adhesions around the gland.

Ménard, M., and Foubert, F. ELECTRICITY IN EXOPHTHALMIC GOITRE. [Jl. de Radiologie, Vol. VI, No. 4, p. 162. J. A. M. A.]

Ménard and Foubert compared the effects of radiotherapy and galvanization in the treatment of exophthalmic goiter; 17 patients were treated by galvanization and 10 by radiotherapy. Certain cases refractory to galvanization were improved or cured by radiotherapy, and vice versa; 57 patients were treated by the two methods, and the number of failures was considerably reduced. Galvanization is an ideally harmless treatment, but this absolute harmlessness, they say, does not prevent its positive efficacy, as results show. The similarity of the disturbances from exophthalmic goiter with those from pluriglandular and sympathetic derangement, suggested extending the action of the galvanic current to the sympathetic and endocrine systems. This abdomen-thyroid-spine galvanization treatment seemed to act on all.

Herzfeld, E., and Klinger, R. IODIN CONTENT OF THYROID. [Schweizer. med. Woch., Vol. LII, No. 29, p. 724. J. A. M. A.]

Herzfeld and Klinger report from Zurich the iodine findings in 201 tests made of thyroids in the fall, the winter and spring. In fully 45 per cent the tests failed to reveal any appreciable iodine. This group included 37.5 per cent with apparently normal thyroid, and 41.2 per cent with pronounced goiter. The group with iodine content between 0.06 and 0.15 per thousand included 37.5 per cent normal thyroids, to 22.5 with goiter. The iodine content averaged decidedly higher in summer than in winter; possibly the summer green vegetables may be responsible for this, or the iodine metabolism may be more active in winter. In 39 thyroids from

Holland, the tests failed to reveal appreciable iodine in only 21 per cent, in comparison to the 45 per cent of the Swiss goiters. The domestic animals with no appreciable iodine in the thyroid formed 33, 24 and 100 per cent of the Swiss cattle, hogs and dogs tested. The food of Dutch domestic animals is evidently responsible for the higher average of the iodine content found in them. All the data sustain, they say, the unconditional necessity for the use in Switzerland of iodized table salt, as from 30 to 50 per cent of all persons have no iodine or only traces of it in the thyroid during a large part of the year.

Kepinow, L., and Metalnikow, S. THE THYROID GLAND AND SENSITIVITY TO TUBERCULIN. [C. R. Soc. Biologie, June 24, 1922, p. 210.]

This experimental study deals with the relationship of the thyroid gland to tuberculin sensitization in infected animals. Four thyroidectomized guinea-pigs and four controls were given a very virulent culture of living tubercle bacilli subcutaneously. A month later they were injected with tuberculin, two of each set being given a lethal and two a nonlethal dose. In the control animals the temperature rose from 1.5° to 1.8° C., and two of them died. In none of the animals whose thyroids had been removed, however, did the temperature rise more than 0.6° C., even in the two which died after receiving a lethal dose. From this it would appear as if two distinct phenomena were being dealt with: one which may be classed among the anaphylactic reactions and which depends for its appearance on the integrity of the thyroid, and one which is purely toxic and which bears no relation to this gland. In a second series of experiments they found that, by injecting the serum of a tuberculous guinea-pig into a normal animal, it was possible to sensitize the latter to the febrigenic factor in tuberculin, but not apparently to the toxic factor. If, however, the serum of a tuberculous thyroidectomized guinea-pig was used for preparing the normal animal, there was no passive transmission of either factor.

Fahrini, Gordon S. RECENT METABOLIC FINDINGS IN THYROID DISEASE. [The Canadian Med. Ass'n Journal, June, 1922.]

The material for this paper is prepared from personal observation of a series of cases presenting evidence suggestive of disturbed thyroid function. The writer endeavors to show how the careful estimation of basal metabolism strikes at the very heart of diagnosis. This applies particularly in differentiating hyperthyroidism from psychoneuroses, essential hypertension, neurocirculatory asthenia, and certain other pathological conditions, the clinical appearance of which is frequently confused with that of disordered functions of thyroid gland. The help given by basal metabolism estimation in both surgical and medical management of cases of hyperthyroidism is clearly demonstrated. It is highly scientific to be able by the use of such a test to observe the recession of the metabolic rate with the improvement of the patient, and this information together

with the clinical findings makes one much more confident in interpreting the result, whether with a view to further treatment or to prognosis. This test is shown to be also of considerable assistance in estimating the toxicity of the patient with a view to surgical operation and probably no other means is at hand so valuable in interpreting the resistance of the case or in other words "the operability." In the treatment of myxedema the metabolic rate furnishes a very exact guide as to dosage required, a guide much more delicate than could be obtained by any other means, not excepting the clinical picture. The author is careful to emphasize that the introduction of indirect calorimetry into the field of thyroid disease must not be used in any manner to the exclusion of the clinical findings and history, but thinks that these three should be inseparably associated in the diagnosis and treatment of thyroid diseases. (Author's abstract.)

II. SENSORI-MOTOR NEUROLOGY.

2. PERIPHERAL NERVES.

Bielschowsky, M., and Valentin, B. HISTOLOGICAL ALTERATIONS IN FROZEN NERVE AREAS. [Jour. f. Psych. u. Neur., XXIX.]

The authors bring valuable histological material from experiments with the treatment suggested by Trendelenburg, *i.e.*, local freezing of the nerves when a temporary interruption of conduction is to be obtained whether in convulsive conditions or in neuralgia. The authors find that the freezing is actually the most suitable procedure for the temporary cutting off of the peripheral nerves. After a brief freezing carried out once practically the entire fiber material is destroyed but regeneration follows surely and relatively quickly. The axis fibers pressing forward centrally in the region affected have no mechanical resistance to overcome and for this reason can press forward easily in the distally adjoining portions. The local application of chemical agents such as alcohol or ammonia on the contrary by causing severe injury presents far less likelihood for the complete restoration of function. Theoretically the method gives the significance of vascular disturbances for degeneration and regeneration, initial "overneurotization" of the conducting fibers and final disappearance of the superfluous supernumerary cables, etc.

Forestier, J. PATHOLOGY OF THE INTERVERTEBRAL FORAMINA. [Paris Méd., Jan. 27, 1923; J. A. M. A.]

Forestier reviews the affections of the spinal nerves passing through these foramina. The most constant clinical sign is a contracture of the dorsal musculature on the opposite side. This contracture is not present if only one root (not the whole nerve) is affected, as in herpes or tabes. The contracture causes a functional scoliosis. The palpation of apophyses of the articulations is painful. The cerebrospinal fluid shows a slight

increase in albumin, with a normal number of cells, while affections of the roots cause lymphocytosis. The clinical picture varies according to the region affected. Torticollis intercostal neuralgia, and the scoliotic form of sciatica (*ischias funiculaire*) with hypesthesia of the radicular type, are different affections of these nerves. A localization in the sacro-lumbar joint is indicated by pains during the change from the sitting to the standing position. Secondary neuralgia of the spinal nerves occurs in tuberculosis, cancer, infections and injuries of the vertebrae, in *spondylose rhizomélisque*, osteophytic vertebral arthritis, and especially in the preankylosis stage of vertebral rheumatism. One very tenacious form of lumbago is a bilateral affection caused perhaps by hypertrophy of the epidural fat. Five such cases recovered after laminectomy. The differential diagnosis must eliminate visceral troubles (aneurysms, renal calculi), affections of the roots and of peripheral nerves. Epidural injections, colloidal metals, roentgen rays and physical treatment act favorably.

Bielschowsky, M. FAMILIAL HYPERTROPHIC NEURITIS AND NEUROFIBROMATOSIS. [Jour. f. Psych. u. Neur., XXIX.]

Bielschowsky brings macroscopic and microscopic anatomical proof that the special disease of the peripheral nerves designated by many French authors as familial hypertrophic neuritis is almost completely identical with certain forms of Recklinghausen's disease, neurofibromatosis or better, in the term of Verocay, neurinomatosis. The essential characteristic of both diseases is a blastomatosis growth of the sheath cells of Schwann with secondary destruction and subsequent regeneration of the nerve fibers.

Dieterich. SUTURE OF NERVES FOR WAR WOUNDS. [Med. Klin., Vol. XIX, Feb. 25.]

Forty-six of 7,000 wounded soldiers in his service required suture of a severed nerve. Of these, seven were fully cured by the suture, and three were improved. The injuries cured were in the radial nerve, and those improved in the external popliteal and the median nerves.

Rodriguez, Jose. A RARE CASE OF MULTIPLE NEUROFIBROMATOSIS (VON RECKLINGHAUSEN'S DISEASE). [Jl. of P. I. Med. Assn., Nov.-Dec., 1922.]

The only unusual feature of the case here presented was the inconspicuous character of the cutaneous lesions in contrast with the usual prominent and obtrusive character of the skin manifestations of this disease. The patient was a seventeen-year-old Filipino, admitted to the Philippine General Hospital in February, 1922. The first lesions, consisting of small nodules appearing along the arms and forearms, were first noticed at the age of seven years. These gradually enlarged and increased in number so that at the time he was admitted to the hospital, these

masses were found all over the body except at the palms and soles. They were especially numerous along the inner surfaces of the arms and thighs, at which places some of the masses were fully as large as a baby's fist but they were hardly noticeable on simple inspection. Other points of interest were the absence of pigmentation and the lack of mental symptoms, which, according to Osler, also characterize this disease. [Author's abstract.]

Brooks, B., and Lehman, E. P. BONE CHANGES IN RECKLINGHAUSEN'S NEUROFIBROMATOSIS. [Surgery, Gyn., & Obstetrics, May, 1924; J. A. M. A.]

Certain bone changes found by Brooks and Lehman in seven cases of this disease seem to them to be characteristic manifestations. These changes were: scoliosis, abnormalities of growth and irregularity of outline of the shafts of long bones including changes which in the roentgenogram appear as subperiosteal bone cysts. Scoliosis, varying in degree, was present in all the cases. Excessive growth in length of long bones was noted in two cases. In one case there was also a marked inequality in the length of the two femurs, but apparently the longer bone was normal. Irregularity in outline of bones was found in five cases, varying from very slight irregularity of the periosteal and cortical structure of the bone to large tumors projecting from the surface of the bone or embedded as cystlike cavities in the structure of the bone. All of the bone changes observed can be explained on the basis of the involvement of the bone by the growth of the tumor tissue which is characteristic of Recklinghausen's disease. These observations emphasize the fact that Recklinghausen's neurofibromatosis is a condition affecting bone as well as skin and nerve. The fundamental process in the disease is one of tumor growth.

Högler, Fr. THE EPIDURAL INJECTION OF ANTIPYRIN IN SCIATICA. [Wiener klinische Wochenschrift, December 14, 1922.]

This author reports some very good results from the epidural injection of 10 to 20 c.c. of an aqueous solution of from 1 to 4 gm. of antipyrin. The injection should not be repeated before two days. If the sciatic pains are limited to the legs, the perineural injection is sufficient, but with pains in the region of the radicles of the sciatic nerve the epidural injection is immediately indicated. The epidural injection is made in the hiatus sacralis, which allows the medication to reach all sciatic nerve radicles. The site of injection is determined as follows: The sacral cornua are palpated and between and below them an indentation is felt, in the center of which a needle 8 cm. long and not too thin is introduced vertically to the axis of the canal. The piercing of the connective tissue membrane covering the hiatus is determined by the lack of resistance. The needle is then turned at an angle of 90°, so that it lies parallel to the sacral canal, and it is then pushed further

in this direction for a distance of 4 to 8 cm. There is no danger of injuring the nerve root as the mere touching of it produces pains and defensive movements. If this should happen, the needle is slightly withdrawn and the fluid is injected without danger. The patient is then allowed to lie in a dorsal or prone position for several hours. The knee-elbow position is the best. With anesthesia of the skin the procedure is painless. Neuralgic pains, frequently associated with sciatica, especially in the adjacent regions of the femoral and lateral cutaneous femoral nerves are also relieved.

Goodpasture, E. W., and Teague, O. TRANSMISSION OF VIRUS OF HERPES FEBRILIS. [Jl. Med. Res., Dec., 1923.]

In this study the authors show that the virus of herpes febrilis in experimentally infected rabbits enters the central nervous system through the pathway of nerves from a peripheral focus of infection. The virus produces a characteristic acute herpetic lesion within the brain and cord, having a definite relation to the nerve whereby entrance was effected. The virus will traverse sensory, motor or sympathetic nerves to the brain or the cord, depending on the nervous supply to the peripherally infected area. The mode of transit is by way of axis cylinders, rather than perineural spaces, and not by passive transportation but by invasive proliferation.

Lhermitte, J. PARALYSIS AFTER SERUM TREATMENT. [Paris Méd., March 8, 1924.]

In this discussion cases of a peculiar amyotrophic paralysis of the brachial plexus occurring after therapeutic injection of antitetanus serum are dealt with. In view of these complications it is indispensable to study the relation between this neurotropic toxic effect and the effectual doses of antitetanus serum which are now manufactured.

Pollock, L. J. THE PATTERN OF WEAKNESS OF THE HAND IN ULNAR AND MEDIAN NERVE LESIONS. [Surgery, Gyn., & Obstetrics, March, Vol. XL.]

Muscles of the hand and forearm sometimes derive their nerve supply from two nerves and the degree of injury to the ulnar or the median nerve is sometimes difficult to determine. The author examined the records of eighty-six cases of injury. Of these twenty-eight were injuries to the median nerve, thirty-three to the ulnar nerve and twenty-five to the ulnar and median nerves combined. The instances of injury to the median are analyzed into four groups which are illustrated by diagrammatic representation of the changes. Ulnar nerve lesions are dealt with similarly. The author is of the opinion that physiological interruption cannot be differentiated from anatomical section by the strength of the movements of the phalanges of the fingers. It is emphasized that recovering or incomplete lesions of the median nerve may

almost regularly be determined by sensory examinations whereas in ulnar lesions this does not apply.

Leriche, R. THE RECURRENT BRANCH OF SPINAL NERVES. [*Presse Méd.*, May 10, 1924; *J. A. M. A.*]

Leriche believes that the physiology of these nerves explains certain pathologic phenomena. He recalls that Luschka's nerve, the small recurrent or meningeal nerve, originates near each spinal ganglion, consists of spinal and sympathetic filaments, enters the spine through the intervertebral foramen, divides into ascending and descending branches which join other similar branches, and give origin to ramifications going to the vessels of the meninges and spine. Luschka's nerve is the sensory nerve of the meninges and spine, and the vasomotor nerve of the vessels of the spinal cord and spinal roots. In cases of radicotomy for relief of pain in amputation stumps, he found the region of the terminal cone and lumbar roots on the side of the amputation covered with abnormally numerous and dilated ramifying arterioles and venules. The posterior roots suffer from compression by these dilated vessels. His physiologic explanation is that the cicatricial neuroma of large nerves in a stump, acting on adjacent nerve terminals, induces sympathetic reflexes which are reflected to the periphery by way of the spinal ganglions. The reflex excitation from the ganglion may pass by the mixed nerve or by Luschka's nerve to the stump. If it takes the latter route, it disturbs the vasomotor innervation of corresponding parts of the spine, meninges and roots. This may entail vasodilatation which may invade the opposite side, and the pain will then be diffuse, without clear localization. He believes that reflex excitation from any cause, after passing through the spinal ganglion, may take the same route. This may induce remote pain in the spine or diffuse radicular disturbances, such as traumatic ascending neuritis. This is not actual neuritis, and it may cause diffuse pains, often spreading to the other side. The same explanation may be given, he says, for remote pains in the spine in pelvic, abdominal, genital or gastro-intestinal affections.

Fischer, A. W. CONDYLE AND STYLOID NEURALGIA. [*Arch. f. Klin. Chir.*, Vol. CXXXVI.]

Fischer reports twelve cases of so-called epicondylitis and seven of styloiditis. The pains were severe and persistent, rebellious to all the usual measures. But the cure was immediate and complete when the inflamed or irritated nerve was simply shifted to a more sheltered position, putting an end to rubbing against the condyle or styloid process. With arthritis deformans of the elbow, the condyle is not so extremely sensitive to pressure, and the chronic character of the neuralgia excludes simple injury from contusion. A rheumatic-infectious factor may add its influence. If no improvement is realized under several weeks of conservative measures, he advises excision of the fascia and subcutaneous tissue containing the nerves for the condyle, or else shifting the nerve.

Troise, E., and Cruciani, J. A. MUMPS POLYNEURITIS. [Sem. Méd., Feb. 14, 1924.]

The spinal fluid was normal and the multiple neuritis in the third week after the onset of epidemic parotitis was evidently peripheral. Atrophy of one testis was pronounced at this time. The polyneuritis gradually subsided.

Paterson, D., and Greenfield, J. G. ERYTHREDEMA POLYNEURITIS. [Quart. Journ. Med., October, p. 6.]

These observers describe the so-called "pink disease"—erythredema polyneuritis—with notes of five cases. Occurring between the ages of four months and three and one-half years, an initial febrile coryza with slight bronchitis is followed by extreme mental misery and irritability, with insomnia and an obstinate anorexia leading to loss of weight. At the same time the rash appears as a diffuse erythema, most marked on the hands, feet, cheeks, nose, and forehead, which become red and swollen, with the appearance of edema, but without pitting. There is marked perspiration of a mouse-like odor, and the hair falls out. There is no actual paralysis, but there is great muscular hypotonia with loss of tendon reflexes and anesthesia over the extremities. The disease affects males slightly more than females, and the poor and well-to-do alike, and it has a widespread geographical and climatic distribution. While not appearing to be a deficiency disease, or due to food poisoning, or infection by the diphtheria bacillus, it seems to occur more frequently during and after influenza epidemics. In two cases examined post mortem the microscopic changes showed peripheral neuritis with chronic inflammatory changes in the spinal cord and nerve roots, the sensory nerve fibers being affected more than the motor. The prognosis is good, and unless the patient dies from asthenia due to anorexia or from complications complete recovery takes place in from three to nine months. Treatment is mainly symptomatic, to overcome the anorexia by careful nursing and the insomnia with hypnotics; small doses of arsenic and strychnine are beneficial.

Garofeano, M., and Labin, Blanche. TREATMENT OF SCIATICA BY EPIDURAL INJECTIONS OF MAGNESIUM SULPHATE. [Arch. Méd. Belges, June, 1923.]

M. Garofeano and Blanche Labin here refer to the innumerable methods of treatment recommended for sciatica, none of which is specific. They have recently tried epidural injections of 25 per cent solutions of magnesium sulphate and have had satisfactory results in seven cases of acute and three cases of chronic sciatica. The authors state that the local application of magnesium sulphate to a nerve trunk abolishes the conductivity and excitability of the adjacent segment, but these functions are recovered speedily if the nerve be washed with distilled water. Intradural injection of 1 c.cm. of (25 per cent) solution per kilo of body

weight produces temporarily after three or four hours all the symptoms of section of the cord, and may give rise to respiratory disturbance, paralysis of sphincters, and especially to retention of urine. The authors have experimented with solutions of magnesium citrate and chloride, in addition to the sulphate; solution of magnesium citrate produces perfect analgesia which lasts longer than that produced by the other salts. The technique is very simple: they inject 10 c.cm. of the 25 per cent solution—4 c.cm. by the epidural route and 2 or 3 c.cm. into the various painful points in the course of the sciatic nerve. They prefer the epidural route as yielding equally good results without the dangers of the intradural method. The results are as follows: The sedative action commences after a period of one and a half to three hours and is more marked the next day; the relief obtained usually persists longer in acute than in chronic cases—in the former it frequently lasts for four days, but in the latter it has not persisted for more than two or three days. In one case relief was not obtained after the injection of 15 to 20 c.cm. No symptoms of intolerance were observed, but chemically pure salts must be used, otherwise the injections may produce pain. Details of the ten cases are given.

Sanders, J. SCIATICA UNDER ROENTGEN RAYS. [Ned. Tijds. v. Gen., Vol. LXVIII, Feb. 9.]

A personal record of a severe attack of sciatica. After the third day of excruciating pain various regions of the sciatic nerve were exposed to the roentgen rays, and by evening the pain had almost completely disappeared. Exposure of the tibialis the next day completed the relief. He had observed a similar result in a patient.

Arcangeli, M. MUSCULAR ATROPHY OF PERIPHERAL ORIGIN. [Arch. JI. d. Chir., July, 1923.]

Photomicrographic illustration of the changes in muscles of rabbits and guinea-pigs after severing the sciatic or facial nerve.

Lange, Cornelia de. HERPES ZOSTER AND VARICELLA. [Ned. Tijds. v. Gen., Vol. LXVII, April 21.]

Cornelia de Lange records the case of a child, aged twenty months, who developed an attack of herpes zoster in the left fifth to seventh intercostal spaces. In the course of the next eighteen days three other children in the same house developed chicken-pox. On examination the blood of the four children all showed a more or less strongly positive reaction to varicella antigen, suggesting the identity of herpes and varicella. It is obvious that every case of zoster is not caused by the virus of varicella. Apart from cases of zoster due to pressure by a tumor on a ganglion or nerve, or arsenical intoxication, other infections such as rubella (Bénard) or tuberculosis (Schreiber) may give rise to zoster. Zoster is not the only proof of the affinity of the varicella virus for the

nervous system, as was shown by Miller and Davidson in a paper on the nervous complications of varicella (*Brit. Journ. Child. Dis.*, 1914, xl, p. 15), in which they recorded a case of varicella complicated by encephalitis, and collected three other examples from the literature, published by Marfan, Caccia, and Osler respectively, as well as of examples of chorea following chicken-pox.

Ellison, E. M. TRAUMATIC DROP WRIST. [*Bost. Med. & Surg. Jl.*, Aug. 30, 1923.]

This patient, a boy of seven, whose mother had bound him with a small rope about his chest, tying the arms two inches above the elbows securely behind his back, and suspending him bodily from the ceiling in the furnace room for approximately forty minutes. The boy struggled rather constantly during this period but was unable to extricate himself. When he was finally "cut down," his "executioner" found him absolutely helpless so far as his hands were concerned. He recovered the use of his hands after five months.

Colonna, P. C. HAMSTRING TRANSPLANTATION FOR QUADRICEPS PARALYSIS. [*Jl. of Bone & Joint Surg.*, July, 1923; *J. A. M. A.*]

Careful study of twenty-four cases which returned for examination and the records of seventy-seven others has convinced Colonna that satisfactory functional results with hamstring transplantation for quadriceps paralysis are the rule rather than the exception. Any accompanying deformity should, if possible, be corrected before transplantation. If sufficient strength exists in the biceps, transplantation of this muscle usually gives better results than those obtained by using the inner group of hamstrings. Negative results are apt to follow if the extensors of the hip are also paralyzed. From a physiologic standpoint it is interesting to consider how the afferent stimuli, accustomed as they are in initiating the motor response to "flex," can be reëducated and taught to produce what would appear to be contradictory effects.

Marinesco, G., and Drăghicesco, S. THE PATHOLOGY OF HERPES ZOSTER. [*Rev. Neur.*, Vol. 30, Jan.]

G. Marinesco and S. Drăghicesco place herpes zoster along with herpes febrilis and herpes preputialis and also epidemic encephalitis in one class, which they call épihélioses neurotropes. All are due to the operation of an ultramicroscopic virus, located chiefly in the nuclei, but also in the protoplasm of the cells at the lesion and all are further characterized by the presence of certain cell inclusions. In the case of herpes zoster they believe that the virus is carried in the lymphatic vessels of the nerves from skin to posterior root or Gasserian ganglia. Thence the virus may be propagated in the cerebrospinal fluid and give rise to an abundant lymphocytosis. It follows that the eruption of herpes zoster is not a trophic manifestation, but a reaction to the presence of a specific virus

in the skin, a virus which histologically and experimentally has analogies with the virus of other forms of herpes and with that of epidemic encephalitis.

Steiger, M. ROENTGEN RAY TREATMENT OF SCIATICA. [Schweiz. med. Woch., May 31, 1923.]

Neuritic and perineuritic cases of sciatica are those for which even a single exposure to the roentgen rays may cure. Older cases may require from two to four sittings. The roots of the sciatic nerve have to be exposed here, even if there is no pain or tenderness at this point. Thirteen cases from his own experience are reported. Here unilateral or bilateral sciatica of from one to sixteen years' standing subsided completely under this treatment, with no return during the months to two years since. In one patient, occipital neuralgia subsided with the sciatica, as also neuralgia of the brachia plexus in another case, and pruritus ani in a third.

Adson, A. W. BRACHIAL PLEXUS. [North-West Med., Feb., 1922.]

A. W. Adson has reviewed the literature of injuries to the brachial plexus and publishes the results of treatment of these injuries in one hundred and one cases at the Mayo Clinic. Forty-five patients suffering from birth palsy and fifty-six patients with other brachial plexus injury have been examined. In the patients under two years of age, approximately one-third showed return of function; in those under five return of function was manifested in approximately one-half and in those over five years the proportion was about one-half. The results of operation for these injuries have not been satisfactory and the author recommends nonoperative treatment for at least some months after the injury, that is, massage, movements and splinting to prevent deformity and aid return of function. He considers that recovery of function occurs mainly in the first three months, but that improvement may occur for twelve months.

Harris, Wilfred. TOXIC POLYNEURITIS. [Brain, Vol. XLV, p. 415.]

Wilfred Harris classifies multiple neuritis on an etiological basis into four groups: (1) Those dependent on the absorption of poisons introduced into the body. (2) Those due to autotoxemia or to poisons developed primarily within the body. (3) Those due to infections of an organismal nature. (4) Those occurring in cachectic states. The author in this paper deals only with lesser known types. Silver is a rare and doubtful cause of polyneuritis, carbon bisulphide and monoxide are also uncommon causes. Acute rheumatism is rarely if ever followed by polyneuritis, yet local perineuritis and fibrositis, as seen in brachial neuritis and sciatica, are common sequels of cold and exposure, though other causes such as dental or intestinal sepsis may contribute. "Chloretone" may produce a flaccid paralysis akin to polyneuritis. Local asymmetrical neuritis is a feature of typhoid and paratyphoid infections. Asymmetrical

neuritis, as well as the more common polyneuritis, may also be seen in chronic alcoholism and diabetes. The polyneuritic psychosis of Korsakow may arise in patients with polyneuritis not due to alcohol. Septicemia is a not uncommon cause of multiple neuritis, differing little from alcoholic neuritis. Acute febrile polyneuritis was frequently observed during the late war. Syphilis as a cause of polyneuritis occasionally acts as an acute infective toxemia, as also do tuberculosis and malignant disease. Polyneuritis may be due to autotoxemia, beri-beri, the puerperium, diphtheria and hematoporphyria.

Mandl, F. MUSCLE ATROPHY AFTER FRACTURES. [Wien. klin. Woch., June 21, 1923; J. A. M. A.]

The fact that very painful wounds predispose to extensive atrophy of muscles leads Mandl to inject procain intramuscularly into the neighborhood of the fracture. Experiments on frogs and on forty patients demonstrated the value of the method. He injected 20 or 30 c.c. of a 0.5 per cent solution of procain when the patient was first seen, and repeated this on the two to four following days. Open wounds and fractures, which are easily dislocated, are contraindications. He explains the favorable results by A. W. Mayer's theory, according to which the lack of muscular tonus prevents atrophy. The procain keeps the tonus low, and atrophy is averted.

IV. SOCIAL NEUROLOGY, RELIGIOUS PSYCHOLOGY, MEDICO-LEGAL, ETC.

2. SOCIAL PSYCHOLOGY.

Carver, Alfred. THE SEARCH FOR A KINGDOM. [Br. Jl. Psych., Med. Sect., Vol. II, pt. 4.]

An analysis of a patient with a "Gradiva" phantasy. He was an Anglican curate who suffered from fugues. He was a happy boy with marked respect for the father, was afraid of being alone and in the dark. He thus often slept in a bed with his father. He had eye trouble, rationalized as due to overwork. While working in Birmingham he became somewhat tense with his work. He took short walks to "think out" the problems connected with his parish work. One of the walks developed into a fugue of 120 miles after four days. He had no memory concerning it, but the amnesia was lifted by analysis. A period of six months' rest was prescribed. He then went to a "quiet" place as a curate. He soon went off on another fugue. This time he only got away sixty miles. He then came for analysis. He was closely associated with a sister, one year his senior. "Birds in a nest feeding their young" was one of their most prized plays. The sister would curl up, playing rôle of mother bird, nest and offspring. He would snuggle into this nest. There was much excitement and cuddling. When four years old, a year later, the patient

became disturbed on noting genital differences from sister. Either he or she was wrong—he leaned towards the former. At five, in learning alphabet, the letters U and V were especially difficult. Micturition urge was frequent when teacher was impatient over his difficulty. Something was wrong and he dared not ask; he grew more sensitive to being “wrong.” A maid then with great secrecy told him a garbled account of the origin of babies. His shyness increased and the urinary urge was more prominent. He began to phantasy an “ideal home” alone with his sister. He was father and child. There was no mother or wife in the day dream. Early religious training was responded to affirmatively and he early imitated the preacher’s rôle. He wrote sermons at eight, one of which the author analyzes. A “big man” in command of a boys’ brigade made some sexual approach, which frightened him greatly and he did not join. Then one morning, finding his father in the bathroom, he thought by keyhole peeping to solve the old riddle of sex differences. All he saw was a waving towel, but he was overcome with panic, with guilt, and some resentment. He now was out of place, no one loved him, cried, and was petted and reassured by the mother. One evening while preaching to his sister he fainted. He now began to be sick and developed some eye defect, which being detected by the teacher, was another thing “wrong” with him. Although no eye anomaly was optically registered, still he needed glasses. This was another “brand.” He then at nine was separated from his sister by going to school. He now worked hard, liked chemistry; “making things” interested him; photography was specially pleasing. Boys’ “urinary” supremacy tests then were in vogue—also he learned through “urine” babies came—but “it had to be done in the dark.” One boy confided “he was educating his sister.” This made the patient sick; but apparently was soon forgotten. A strong boy friendship was then made. They worked on detective codes and “secret” things. At thirteen, on the model of the Prisoner of Zenda, he founded an imaginary kingdom. As they walked or bicycled the territory covered was included in the kingdom. Confirmation at fourteen, great seriousness, and ideas of being a “missionary to China” then followed. Confessing was always put off, and when at eighteen, taken too lightly, caused irritation—“he was not understood.” Oxford followed; he intended taking Holy Orders, but doctrinal doubts arose with great ensuing spiritual conflict. He felt “dark” as when he “fainted” when preaching to the sister. He tried to push himself towards his China mission, but failed. “Nervous eye affection” was diagnosed. He had a breakdown and lost a year. He went through his Oxford period in theology. His “Kingdom” would be at home. In his junior curacy he lived at home—it was as in childhood. He broke down again, from eye weakness. The war coming on changed the curacy; but it took him out of his home—but only five miles. His old feelings of guilt were still operative in spite of renewed effort put into his work and into the Boy Scouts. Confirmation classes

were hard because he had to talk "purity." Insomnia and a recurrent "sliding down a church steeple" dream annoyed him later. Then an accusation of a "pederastic" act by one of his cloth annoyed him greatly. He was shocked and held himself aloof from any signs of friendliness to boys lest he too be accused. Headaches, constant ideas of exorcising his devils, etc., and much "eye" trouble, culminated in advice to "rest." When an oculist put drops in his eyes he had an idea he would be exposed. A period of mild excitement then followed. Later in a period of great perplexity concerning his allegiance to his superior, the first fugue occurred. Carver now goes over all of the material and shows the analogies to the "Gradiwa" story. The patient finally finds the "girl" he has been hunting for and makes an excellent recovery.

Brun, R. THE THEORY OF NATURAL SELECTION AND THE PLEASURE PRINCIPLE. [Int. Zeit. f. Psal., Vol. IX, No. 2.]

In this article Brun gives views suggested by Erich Wasmann's monograph on the care of commensals by ants. According to Darwin's theory of natural selection, the phylogenetic development of the instincts, instinctive behavior, and the psychoplastic peculiarities of the various species follow the principle of utility, or, as psychoanalysis would say, the reality principle; the pleasure principle would then have no real share in these processes, at least in the sense of a formative factor.

This view seems to be contradicted by the fact that the exercise of instinctive activity, indeed even the preparation for instinctive acts, is connected with pleasure, nay more, that this pleasure seems to be the objective purpose of the act no less than the subjective purpose, to be, in fact, the real driving element. The defenders of natural selection may say that "nature" has provided this means to attain her purpose, but the introduction of this teleological fiction is not a solution of the problem, for "nature," to which one here has recourse, is just that which is to be explained.

Father Wasmann's recent observations on ants, Brun says, have important bearing on this question. Like other social groups, ants have a host of unbidden guests, "spongers" and parasites. The larvae of some sorts of these guests are cared for by the ants though these strangers bring about great harm to the ant colonies, the workers devoting their energies to feeding their guests to the neglect of their own species. As result the female ants degenerate into those miserable wingless creatures called pseudogynes, incapable either of working or breeding. These strangers secrete a certain oily exudate which acts on the ants as a sort of intoxicant and gives them great pleasure. Thus it may be seen that from this sympathy the guests draw biological advantage; the ants only pleasure. The American biologist, W. M. Wheeler, has made similar observations. He found that ants derive pleasure and stimulation from the secretion of the larvae for which they care, their own larvae as well as the larvae of

their guests. Wasmann does not agree with Wheeler that there is a real "trophallaxis" or exchange of nourishment, but the discovery is nevertheless most important in that it shows the primacy of the pleasure principle in the formation of ant colonies and permits the peculiar form of "sublimation" in the neuters to be explained in accordance with this principle. In the light of the facts discovered by Wheeler, the phenomena of symphily are explicable as a biological parallel for the well known clinical phenomena of distortion.

These observations lead to the establishment beyond all doubt of the fact that there is a specific tendency to symphily on the part of the ants, and also of the astonishing fact that not only do the parasites become accustomed to the ants, but *vice versa* the ants to the parasites; that is to say, there is a cleronomically developed capacity to care for another species, even at the sacrifice of their own, which cannot, therefore, be explained by the theory of natural selection. Indeed, it might be said that this tendency has been developed to thwart natural selection and for the sole reason that it brings pleasure.

To explain this phenomenon it is not necessary, in Brun's opinion, to resort to Wasmann's "service of an external species," which is in direct contradiction to Darwin's theory, nor to an over-soul in nature. It is only necessary to make a partial revision of the theory of natural selection and ascribe a certain importance to the pleasure principle as a phylogenetic factor which is effective as long as the species in question survives. If the libidinal selection works against the natural selection the species affected must finally become extinct, though the process may be slow.

In conclusion, Brun says that the idea of utility in the form in which it is accepted in the old theory of natural selection springs from an autistic-anthropomorphic manner of thinking, out of keeping with our present insight into the course of vital events, and that it must be abandoned if biology is to keep pace with the advances of our knowledge. The new views to which we are brought by Wasmann's studies, he notes, are entirely consonant with the results of psychoanalytic research.

Peine, Sieg. ON THE NEUROTIC ROOTS OF INORDINATE CRAVING FOR CHANGE. [Int. Zeit. f. Psa., Vol. VIII, No. 2.]

The intensity with which we feel attracted to a person varies at different times. In how far, asks Peine, is such variation natural and at what degree may it be looked upon as pathological? Having indicated in a general way the changeableness which may be considered abnormal, he gives a brief outline of some of the neurotic attitudes responsible for too great fickleness, both psychic and sexual.

(a) The neurotic as a child had an abnormally unstable libido over-susceptible of stimulation. Perhaps there was no suitable object at hand or shyness prevented activity, so that there arose a sort of permanent libido hunger.

(b) Because of the bipolar attitude between excessive impulse and hindrance in satisfaction the neurotic was forced to make a choice between a substitute for the love object or a substitute for satisfaction—with the result that the libido is repressed.

(c) The repressed impulses and conflicts become mute, but that is all: the inner unrest, the libidinous ravening hunger takes the form of an unsuccessful repression.

(d) The neurotic continues the acts of repression until there is a fixation on the mechanism of repression, a habit of change of stimulus to which the patient becomes accustomed in his psychic conduct.

(e) The neurotic succumbs to his destiny and the permanent non-satisfaction engenders in the unconscious a ceaseless haste and constant quest for peace, for equilibrium.

(f) Normally the libido serves as a stimulus and as an incentive for the creative forces generally. For the neurotic, the whole apparatus goes too rapidly, the machinery is in a constant state of vibration, and the nervous energy is imperfectly used and insufficiently elaborated into reserve force. It is for this reason that the neurotic feels himself too weak for intensive work. Just as he never finds peace in his libido, complete and satisfactory outlet, so it is with his psychic work; he completes nothing, he is constantly beginning anew from other points of view.

One particularly marked trait of the neurotic is at the beginning of every erotic situation to exaggerate the attachment in phantasy. Disillusioned, he then takes flight permanently in phantasy and the unreal. He makes for himself an impossible ideal and finds repeatedly that the real object falls short of it. Thus the fickleness, the Don Juanism, is a reaction to the overswing of the first phase, and also a sort of fore-pleasure fixation.

The pleasure in conquering and deserting has a sadistic coloring and the neurotic of sadistic trend arrives over this path also at a Don Juan attitude. His self-satisfaction is enhanced by the consciousness of making "new impressions."

As to the possibility of cure, Peine believes that if the unconscious complexes are brought to light by psychoanalysis and successfully solved the individual will feel himself released from the ever increasing need for change; he will be more stable, "truer" both to the love object and in other situations of life. A wide field is here opened for psychoanalysis, not only for physicians, but in pedagogy and ethics, from theoretical as well as from practical points of view, and the psychology of marriage and vocational psychology may well expect valuable assistance in this direction from psychoanalysis.

Long, Constance. "MARY ROSE." [Br. Jl. Med. Psycho., II, 68.]

Barrie has written this delightful drama which is here subjected to an analytic interpretation both valid and interesting. Jelliffe and Brink

did a series of these in somewhat similar fashion which were brought together in a monograph on "Psychoanalysis and the Drama." Other analytical discussions had preceded and followed. Kempf's study of the Yellow Jacket, also briefly treated by Jelliffe and Brink, and this analysis of Mary Rose are among the best of these later efforts. The analysis is too detailed to be abstracted. It should be read here in the original. It is a truly delightful bit of work, one of the last given us by this gifted woman who has but recently died.

Boehm, F. CONTRIBUTIONS TO THE PSYCHOLOGY OF HOMOSEXUALITY.

II. THE DREAM OF A HOMOSEXUAL. [Int. Zeit. f. Psa., VIII, No. 3.]

A dream is analyzed to justify the claim that polygamy and homosexuality are related (and assertion made in a former article by Dr. Boehm which was abstracted in the Psychoanalytic Review, Vol. IX, page 74). It is there stated that the homosexual man comes in contact with other men through the polygamous woman. Analysis of the dream of Boehm's patient revealed the phantasy that the mother had an immense concealed penis which was a source of danger; upon this was founded the patient's fear of women. The wish of the homosexual to come in contact with the penis of the father in the vagina of the mother, or with that of another man through intercourse with a polygamous woman, the author believes, may be an elaboration or reconstruction of the phantasy of the retracted penis of the mother. He notes however that he was always able to discover the first phantasy more easily and earlier than the other. This dream he finds contributes to explain why homosexuality and polygamy stand so close together, for an anxiety toned phantasy which renders the approach to the mother impossible is liable to produce polygamy as well as homosexuality, as both are the expression of the impossibility of approaching the mother. This repulsion is referable less to external causes than to the phantasies and among them that of the concealed penis. Boehm found this symbol in the dreams of both men and women, though it assumed many different forms. Ferenczi reports an infantile idea of the female genitals which showed the same trend, as did Freud in his analysis of a boy five years old. Reik's description of "Puberty Rites among Savages" probably offers an example of another emergence of this phantasy. It may be assumed that the monsters hidden in the wood, which among other forms, took those of the jaws of a crocodile and of the beak of a cassowary, and upon the bodies of which circumcision was undertaken, represent the concealed penis of the woman.

Kolnai, Amel. SIGNIFICANCE OF PSYCHOANALYSIS IN THE HISTORY OF THOUGHT. [Int. Zeit. f. Psa., IX, No. 3.]

Kolnai points out that psychoanalysis has entirely changed our world outlook. He shows that it has rendered service to determinism, positivism, and rationalism in reducing to scientific formula what was hitherto mere

speculation, and in dealing with phenomena without a preconceived system of values. On the other hand, through its theory of the unconscious and of the instincts, it has struck a blow at physiological materialism. The writer emphasizes the essential difference between the suggestive and hypnotic therapy with its blind faith and yielding to authority and the psychoanalytic therapy, the aim of which is to establish critical self-direction. Psychoanalysis does not aim to overcome isolated symptomatic disturbances (alcoholism, for instance), but taking the whole mental structure into consideration, inclusive of the infantile fixations and their deleterious reactions, it seeks to bring about changes that will place the personality in line with the highest individual development possible for it. In contrast with modern occult theories, such as Christian Science, etc., psychoanalysis does not insist on antecedent belief in the good result of certain procedures. It explains such belief as an example of the delusion of the "omnipotence of thought," in subordination to the pleasure principle. Psychoanalysis seeks to extend the field of conscious control, with due recognition of the unconscious, but without giving free rein to it. The psychoanalytic theory has furnished a comprehensive foundation for popular beliefs, and a scientific interpretation of ideas which are emotionally determined. Considering the relation of psychoanalysis to ethical thought Kolnai says that psychoanalysis, by releasing repressions renders possible the conscious acceptance or rejection of instinctive impulses, a condition favorable to sublimation and the reality principle in place of the pleasure principle, as the dominant one in individual behavior. Kolnai refers to the idea which has been suggested that psychoanalysis brings to bear the same critical function on the manner in which the individual soul is constructed as does Marxism on the social structure and that it is therefore to be regarded as a form of Marxism and as holding the same views. He enumerates the points of similarity between Marx's system and that of Freud: 1. The discovery of "animal" factors beneath the veil of ideology. 2. Recognition of the volitional element in various views. 3. A dialectic method represented by the solution of opposites. In view of the points of difference which he also sets forth, Kolnai regards these resemblances as negligible. The differences are: 1. The existence in Marx's system of a dogmatic, monistic, economic theory, incapable of further development, contrasted with the many-sided scientific system of Freud. 2. Mere generalization of rational interests contrasted with researches into the deep mechanism of the soul. 3. The positing of pre-determined evolutionary processes contrasted with speculations always within the scope of empirical verification. 4. The premise of the absorption of the whole of mankind in an impersonal proletariat contrasted with the assurance of individuals endowed with critique and power of self-control. Psychoanalysis, he says, has more in common with the physiocratic individualistic social theory which directs attention less to the economic side of social spirit than to the fundamental principles under-

lying both the social and economic conditions—principles which are given their fullest value in psychoanalysis. He believes, therefore that if a new order of things is now to be constructed on the ruins of the Marxian social revolution and a social reform is to take place in which all elements are to be given due weight, inclusive of a new freedom of spirit beyond the old mechanistic puritanistic liberalism, it is from psychoanalysis that the secrets concerning the libidinal satisfaction and rational freedom must be learned.

Carp, E. A. THE RÔLE OF THE PREGENITAL LIBIDO FIXATION IN THE PERVERSIONS. [Int. Zeit. f. Ps., X, No. 3.]

Carp notes that in the perversions the phenomena of repression construction of symptoms do not play so great a rôle as in the neuroses and that for this reason it is easier to study the infantile sexual life in the former disturbances. He cites a case where the analysis revealed the pathogenesis of a peculiar form of homosexuality which was doubtless due to a primitive fixation of the libido; an accompanying compulsion neurosis offered the writer opportunity to follow the libido fixation to a very early developmental period and to establish a connection with the perversion.

The patient, a well-educated merchant, first sought medical advice because of a compulsion to stare at people in the street. He had always had a strong mother attachment and found protection from the severe father, in her. When about four years of age, induced by scotophobia, he lifted her chemise and was terrified at the sight of her nates. A strong oral erotic was evidence of a fixation on a component belonging to a primitive libidinal organization, manifested in perverse urges to suck. He preserved this cathexis throughout his phantasies and dreams. Another feature indicating the nature of the fixation was that in his phantasies the nates were compared with the mother's breasts. There were numerous other evidences of an anal-erotic emphasis, which, as is well known, leaves behind in the male a predisposition to homosexuality. From earliest youth the patient had had homosexual inclinations and had engaged in open homosexual practices. The writer comments that it was certainly no mere coincidence that a compulsion neurosis developed on this favorable soil, prepared by the anal-sadistic libido fixation. The outbreak of the neurosis was conclusive evidence that there had been repression of a part, at least, of the anal sadistic libido, indicating the necessity of amending the view that perversions are the direct negative of repressions. The writer finds that the patient only found a partial satisfaction for his infantile oral libido in his perversions; a part had been repressed and in dream the patient still sought the mother's breast.

The writer cites another case of homosexual perversion in a woman in whom the oral libido fixation also played a prominent rôle. She assumed a masculine rôle and it was evident that her "desire for a

penis" was the desire for the mother's breast. Believing that cases of this sort may be more numerous than supposed the writer outlines the probable mechanism: the abnormal attachment to the nipple at a period before the Œdipus complex had made its appearance, that is in the lactation period, probably constituted the nucleus of the strong oral component instinct. There was evidence in the dreams that at the time of weaning the Œdipus complex was beginning to manifest itself, in a certain sense as a censor, under the influence of which the strong component instinct was forced to change its object, but the erogenous zone remained the same. The part instinct aided in the solution of the Œdipus complex by introjection, the cathexis of the mother's breast being transferred to a part of the person's own body by means of identification. In the further progress of development when there was an object, this object was made use of to satisfy the original organ pleasure; the primary pleasure-toned acts were repeated. The writer notes in conclusion that not alone through the repression of the Œdipus complex, but also through the introjection of the beloved mother object or a part of this object the transformation of a very strong part-instinct into a perversion may be effected. The fact that in this process there is always a repression is shown by the outbreak of a neurosis in the writer's first case here described, a concurrence to which Sachs has already called attention.

Boehm, Felix. CONTRIBUTIONS TO THE PSYCHOLOGY OF HOMOSEXUALITY:

I. HOMOSEXUALITY AND POLYGAMY. [Int. Zeit. f. Psch., VI, No. 4.]

A long sojourn in a northern city permitted Boehm to make observations concerning the social life there prevalent. He found that members of the cultured circles showed numerous traits of erotic infantilism. The expression "I could turn Catholic on account of that!" was often used as a substitute for the expression "That is driving me crazy!" and he explains this usage as due to the fact, generally recognized, that in the more southern Catholic cities there is much greater freedom in the direction of sensual pleasure. The Protestant women in these northern cities are proud of wearing dark inconspicuous dresses, and avoid décolleté; engaged couples meet only in the ballroom, on the skating pond, or in the tennis court, and the entire social life is in keeping with these customs. The result is that a very strong and almost universal emphasis is placed on the homosexual components in the social life, of which one expression is the great interest taken in students' associations. In these clubs and sororities the most pronounced homosexual practices prevail, and companionship with the opposite sex is almost entirely dispensed with by the members.

The absolute chastity of girls of the better classes is a matter of course, and the male students rarely undertake relations with girls of lower social station. Hence the brothel life in these sections is very pronounced; every city, no matter how small, has one or more open

houses. Students belonging to the same association usually visit the same house of ill repute, with the result that the same girl is visited by various men, is discussed among them, and is recommended by one to the other, to the extent that certain girls are considered to belong to certain clubs or circles, and these female companions are frequently exchanged, or several members of the same association support the same mistress. Boehm observed that students who indulged in sexual relations of this sort were often tortured by ideas of guilt, to the point of attempting suicide, but without being able to break away from this form of life. In this Boehm sees a compulsive factor which he traces to the homosexual trend. The contrasting conditions of life in a south German town, where there is much greater freedom of intercourse between the sexes, is then described by Boehm. Here he found much less promiscuity; exclusive attachments were formed between the male students and women companions; a sort of companionship grew up which almost resembled monogamous life. Young men made journeys in the open with their women companions, visited dances, theaters, concerts, and lectures—always with the same girl. From these observations the author arrives at the conclusion that the heterosexual impulse is related to monogamy while the homosexual tendency leads to polygamous activities, and briefly expresses this relationship in the form of a geometrical proportion:

Heterosexuality : Monogamy : : Homosexuality : Polygamy. This, he says, is a formula which may be applied to nations, strata of society, or to social circles. In support of this view he cites examples from the history of the Greek and Germanic nations. Boehm analyzes in this connection the life of married persons: the husband who seeks the companionship of men in the drinking saloon; the small man, of inferior mental endowment, who marries a masculine woman with slight physical charm but intellectually bright. In conclusion he states that he regards the brothel as the instrument of homosexuality, and a house of ill repute as a disguised means of satisfying homosexuality, but makes the reservation that only those men should be regarded as definitely homosexual who cannot give up polygamous activities in maturity as a certain homosexual trend in early youth is not abnormal. Through the intermediation of the promiscuous women the homosexual man indulges his inclination for the absent sex; in the last analysis it is the mother or father to whom his attachment has remained fixed, whom he is seeking. The homosexual woman attains the same end through the polygamous man.

BOOK REVIEWS

Cooper, Eugenia R. A. THE HISTOLOGY OF THE MORE IMPORTANT HUMAN ENDOCRINE ORGANS AT VARIOUS AGES. [Oxford University Press, New York, London, etc.]

Here the author presents in a book of a little over a hundred pages a detailed consideration of histological study of the endocrine organs at different periods of their development with the thought that such objective findings shall be found useful for pathological correlations.

In the literature of endocrinology practically only the thymus has been studied from this viewpoint; some analogous work on hibernating thyroids is available but in the main there is lacking the type of information which this little book so amply provides. Moreover it is very well offered both as to quality and quantity and all students of endocrinology will enjoy this little book and keep it as a source of information.

Bowers, Paul E. MANUAL OF PSYCHIATRY FOR THE MEDICAL STUDENT AND GENERAL PRACTITIONER. [W. B. Saunders Company, Philadelphia and London.]

Psychiatry bids fair to be one of the most popular of all of the branches of the mental sciences. Even though that husbandly judgment of the old Quaker may not be altogether believed in which he told his wife that "all the world is queer save me and thee, and thee is somewhat queer," yet when the statistics of the New York state institutions show that one in twenty-four of the population pass through the state hospitals all is not well in the state of Denmark, call it by any name you will.

Then, what with crooks and quacks, reformers and questionable judiciaries, prohibitions which engender degradation rather than saving from cirrhosis, it is no wonder the world should turn to the psychiatrist to know what's the "shooting 's all about."

Dr. Bowers here gives us a rather formal didactic presentation of the general situation. It will be found to be a most useful introduction. It is not very inspiring nor thought provoking, but will be nevertheless of service.

Gesell, Arnold. THE MENTAL GROWTH OF THE PRE-SCHOOL CHILD. [The Macmillan Company, New York.]

Here is a book of transcendent interest. Scholarly and yet human; profound in its insight and sympathy and at the same time adequate in getting it over to the crowd. Stanley Hall would have welcomed such a study and been proud of its effort, even though the reader might at times feel chilly at its oversystematization, at

least in the printed pages, so concise and formal is it presented. "For God's sake," says the humanist, "drop the labels and talk about human beings." It seems all so prisonlike. One almost shudders as one turns the pages, and yet cannot fail to acknowledge that the facts are all here. Such rigidity! The apotheosis of science—on ice. In the language of the mystics this book should be read in July or August to thaw its chilly pedagogic trend into a humanistic presentation.

Burt, Cyril. *THE YOUNG DELINQUENT.* [D. Appleton & Company, New York.]

There are times when the reviewer is willing to accept the jacket cover estimate of the bulky volume encompassed within. This is one of them and we quote with approval what the publishers themselves say about this book.

"This book approaches the problem of *the young criminal as a study in child psychology*. It discusses both the causes and the treatment of delinquency in the young.

"Not the least interesting pages are those which tell the stories of young offenders whom the writer has actually tested and examined in the course of his work.

"But the chapters also deal with the treatment and training of 'naughty' or 'difficult' children generally, and with the discovery of the origin of their misconduct.

"Though based upon exact scientific investigation, this book is written in simple and nontechnical language. Its appeal is not only to probation officers and medical men, but also to parents, teachers, social workers, and all who are interested in the welfare of the child."

Having said all this—we still look for something more fundamental in the understanding of the delinquent. In this respect we feel that American insight à la Healy is far in advance of English insight à la Burt, even though we must hand it to the English for its unprecedented form and skill of portrayal.

Timerding, H. E. *DAS PROBLEM DER LEDIGEN FRAU.* [A. Marcus and E. Weber's Verlag, Bonn.]

The New York American would have a great time—in red letters splurged across the page—in recording the case of this fifty-three year old highly respected and ethically minded school marm who had an "affair" with a fourteen year old boy and was sent to jail for eight months. And yet, as the author here remarks this is but an index of a most serious group of problems, sociologically speaking, which are discussed in this quite intriguing monograph.

Elinor Glynn in her "Three Weeks," and other novelists; "Black Oxen" as a title, among others, with their endocrinological phantasies, and God knows what; "Young Woodley" now running on the New York stage, these and countless others indicate that there is such a thing as a Jocasta problem, as Sophocles showed when he wrote Oedipus Rex. In other words, there are older, single and other

women who seek the rejuvenescence—through youth—of lost opportunities, and like Lot's wife are turned into a "pillar of salt."

Should the reader of this notice be interested in this isolated whorl of minor eddies by all means read this monograph. It contains much meat for reflection, not the least interesting of morsels being how some pimps live upon older women.

Lévy-Suhl, Max. NEUE WEGE IN DER PSYCHIATRIE. [Ferdin and Enke, Stuttgart.]

An excellent short monograph which leans upon genetic psychology as offering an insight into the psychiatric wilderness. As in Hamlet we are told there is "method in madness," so the phyletic mode of approach offers a point of view of interpretative application which should not be neglected.

Freud has approached the situation from actual analytic investigation; many who have been forced to recognize the truths thus unearthed have been prone to fall back upon the genetic mode of approach to support the more academic issues heretofore in vogue and thus bridge the gap between a priori postulates and analytic findings. This the author has most excellently essayed.

A most interesting discussion along the lines already available in Storch's excellent monograph (Monograph Series No. 36 on Archaic Experiences in Schizophrenia), which practically says most of what this present study offers.

Senf, Rudolf. HOMOSEXUALISIERUNG. [A. Marcus and E. Weber's Verlag, Bonn.]

Marcus's "Abhandlung aus dem Gebiete der Sexualforschung," Vol. IV, Heft 3, contains this small monograph of 75 pages.

While the silent observer of human behavior cannot fail to be struck with the fact that the human race is still in its narcissistic stage of psychosexual evolution, speaking in the large, and that unsublimated homosexual trends are obvious no matter where one looks we search in vain in this monograph for the insight into the problems that Freud has given us in his classical "Three Contributions." Here "manifest" content is alone in evidence and as such the monograph contains excellent observational material, but of deeper insight there is little. It is an excellent discussion at descriptive levels and as such is welcome.

Curschmann, Hans. NERVENKRANKHEITEN. [J. F. Lehmann's Verlag, München.]

The clinical series of handbooks of the Münchener med. Wochenschrift is here represented by a short, clear and concise manual of nervous diseases. We have had occasion to praise Curschmann's larger textbook and have nothing but admiration for the skill this author has shown in this compendium.

No claim of completeness is made by the author, yet at the same time he has given an excellent short manual of nervous diseases.

Tischner, Rudolf. FERNFÜHLEN UND MESMERISMUS. (EXTERIORISATION DER SENSIBILITÄT.) [J. F. Bergmann, München.]

The "Grenzfragen" established by Löwenfeld and Kurella now number 120 and are under the editorship of Kretschmer of Tübingen, a possible successor of Stertz. It deals chiefly with "projection" phenomena, using the Freudian conception, but here spoken of as "exteriorization of sensibility."

It deals with certain aspects of so-called occultism, as Richet and some present day metapsychical students have attempted to deal with them.

Avowedly we have little sympathy with these so-called "phenomena" but are much intrigued with the "private psychoses" of those interested.

Henry, George W. ESSENTIALS OF PSYCHIATRY. [Williams and Wilkins Company, Baltimore.]

This work opens up well. It is excellently presented from the bookmakers' point of view, but after exciting our interest that we are about to get something quite in line with present day developments of psychiatry the work peters out into something quite ordinary.

Oppenheim, Moriz. PRAKTIKUM DER HAUT UND GESCHLECHTSKRANKHEITEN FÜR STUDIERENDE UND AERZTE. Vierte, unveränderte Auflage. [Franz Deuticke, Leipzig u. Wien.]

The advances made in dermatology and syphilography are here recorded in this most excellent short practical manual. The modern slogan of medicine which emphasizes that the body is a unit and not a disparate collection of organs renders it necessary to recognize that the nervous system is the integrating mechanism that makes this unicum a practical possibility. Although this manual is not built upon such a philosophical basis, yet the author's broad experience unwittingly arranges his material in accordance with this principle. Hence the work cannot fail to be of service to neuropsychiaters.

Bayliss, W. M. PRINCIPLES OF GENERAL PHYSIOLOGY. Fourth Edition. [Longmans, Green & Co., New York and London. \$8.50.]

Although Bayliss in the flesh has left us, like John Brown, his soul goes marching on, and this fourth edition of one of the most masterly treatises upon physiology extant through the combined efforts of a committee of Bayliss' friends, under the directorship of Professor A. V. Hill, records not only the devotion of a most distinguished group of scientists to a loved master, but also has given to the students of physiology, whether as specialists or as beginners a work of surpassing excellence and importance.

Prepared as it was during a period when Bayliss was ill and with the expectation that he himself might take on the helm for further editions the present revision has been sparing, but yet the work has been brought to date in the various fields of activity with which it

deals. Unfortunately Professor Bayliss died August 27, 1924, just about as the final proofs were about to be presented to him.

Thus, apart from its importance in the field of physiology here is a record of professional team work of at least twenty-four co-workers, quite unique in medical history. Only to read the preface is to feel that one is breathing the fresh air of inspiration, especially in those portions where Claude Bernard is quoted concerning the interactionism of life with the physicochemical forces of the cosmos. Here the energetic pattern of Heraclitus receives a new and forward pushing formulation and the author disposes of petty academic quibbles in a definite and satisfactory manner.

In the review columns of this JOURNAL we have been unstinted in our praise of this treatise and although we cannot speak with much sense of authority concerning many of the chapters, we can say that those dealing with the physiology of the nervous system are exemplary.

Adrien, Anrep, Hartridge and Evans are the responsible authors for the revision of these chapters in the general formulations of which our own Parker's researches are drawn and relied upon, and Sherrington's masterly studies upon the reflex mechanisms are excellently summarized.

We can only regret that the higher cortical integrations are not dealt with.

Bisch, Louis E. CLINICAL PSYCHOLOGY. [Williams and Wilkins Company, Baltimore. \$3.00.]

This is a valiant book. The author subtitles its purpose to be a "practical guide for the recognition, diagnosis, treatment and disposition of the atypical child" and should appeal to the public school teacher, the "ungraded" class teacher and to those interested in the backward child. Further he aims to interest the school nurse, psychologist, psychiatrist, neurologist, juvenile court, and social worker, the eugenist, the biologist and the physician.

And we can say that for the most part it fulfills the purpose of its jacket statement. It will be found to be a very useful book especially for those who have to deal with defective or delinquent children.

Furthermore we have a very excellent specimen of bookmaking.

Odier, Charles. LE COMPLEXE D'OEDIPE. [La Petite Fusterie, Genève.]

A small but fascinating monograph upon the Oedipus Complex as it relates to character, to health and to "destiny" by a Swiss neuropsychiatrist who has thrown his interests into the psychoanalytic movement.

In Saussure's larger monograph upon "Psychoanalysis," which was one of the outstanding literary memorials, Odier contributed some dream material. To the initiated the working out of this material contains much of moment, but for the world at large it has no significance. Yet it definitely aligns the author with the

interests of psychoanalysis and this brief summary, *i.e.*, brief, in view of Rank's study on the "Incest Motiv," places Odier in the footlights of the situation.

While there is nothing novel in that "psychoanalytic study," so far as the general proportions of the movement is concerned, yet it contains details of perspective which are of value, and a mode of treatment which furthers the cause. Nowhere have we found so clear and precise a delineation of the "Oedipus complex" and hence its value to those who would understand this most important of Freud's formulations.

Glueck, S. Sheldon. MENTAL DISORDER AND THE CRIMINAL LAW. A STUDY IN MEDICO-SOCIOLOGICAL JURISPRUDENCE. [Little, Brown and Company, Boston.]

"In 1922 there were 17 murders in London every one of which were solved; in New York city in the same year there were 266 murders and three solutions found." This is one of the striking opening sentences of this very remarkable book, written by an instructor in the Department of Social Ethics of Harvard University. It certainly shows something about the world we live in and this is but an index of the prevalence of crime and the immunity from detection and punishment of the crook. But the chief aspect of this splendid book is upon the mental states that render such conditions possible, hence we have here a careful, sound and most illuminating treatise upon the relations of mental disease to criminality—a real medico-sociological contribution.

Our space forbids a thorough detailed review, much as this work deserves one. It is by far the best thing in its line and should be at the elbow of all interested in medico-legal matters.

Strecker, Edward A., and Ebaugh, Franklin G. PRACTICAL CLINICAL PSYCHIATRY FOR STUDENTS AND PRACTITIONERS. [P. Blakiston's Son and Co., Philadelphia. \$4.00.]

Much as one would seek to dodge the facts, it must be faced that in every human community there exists an appalling amount of mental disorder of milder or severer grades. At least one in every twenty-five individuals in the community passes through a mental hospital and at least one in every ten has some disabling or crippling neurosis or psychoneurosis. Psychiatry therefore becomes one of the most important of all branches of medicine even though the average practitioner rarely sees it that way.

Any help is welcome and the present small volume is such. It is a straightforward clinical psychiatry patterned much after Kraepelin's well known volume of the same name and presents the Kraepelian descriptive psychiatry in a readable and intelligent manner. Furthermore the authors have given short discussions of their clinical case reports which are quite simple and sane. The book is quite commendable for its readability. It is not meant to be a complete fundamental treatise but simply a guide, and it is an excellent one for its purposes.

NOTES AND NEWS

UNVEILING OF CAJAL'S STATUE

In El Retiro, the historic and most beautiful park of Madrid, a monument by the sculptor Victorio Macho has just been erected to Cajal. Macho has shown originality. A pond fed by the Spring of Life and the Spring of Death lies before a wall, which opens in the center to make room for a statue of Wisdom. Cajal's statue overlooks the water. The head especially is an excellent likeness. The king, the premier, all learned societies and government officials attended the unveiling, as well as a large crowd of students and admirers of Cajal as a scientist.—Madrid Letter. J. A. M. A., May 2, 1926.

THE SEVENTIETH BIRTHDAY OF PROFESSOR FREUD

As the seventieth birthday of Siegmund Freud, the founder of psychoanalysis, approached, his friends and pupils arranged for special ceremonies, although it was evident that the central figure would gladly have dispensed with display. Freud has spent his whole life in Vienna. He had to pass through the usual struggle with the forces of misunderstanding, ignorance and malice before he came to be recognized, and his doctrines were accorded full honors in foreign countries before they were accepted at home. In 1893, he published in collaboration with Dr. Breuer a small treatise entitled "Studies on Hysteria," which contained an exposition of the fundamental principles of psychoanalysis, as demonstrated on a female patient. Freud showed in that treatise that, in the manifestations of hysteria, forgotten, or at least suppressed, conceptions or ideas played a predominant part. In his "Dream Interpretation," which appeared in 1900, he showed that "the subconscious mind" determines all our thoughts, acts and expressions of instinctive impulses. That demonstration opened up the way to an understanding of the normal psychic life and made clear also the manifestations of the pathologic psychic life. The treatises on "Witz und Unbewusstes," "Massenpsychologie," "Das Ich und das Es," and "Jenseits des Lustprinzips," mark the milestones in the development of the system.

The Psychoanalytic Society, founded by Freud, is closely associated with allied societies in Germany, France, England, Italy and Spain. This organization has helped to demonstrate to the medical profession the significance of sex in the psychic life, just as researches on symbolism and perversion have furnished an insight into the problems of neurosis. On Freud's seventieth birthday, all the newspapers of the city, at the request of their readers, published popular articles on the nature and methods of psychoanalysis.—Vienna Letter. J. A. M. A., May 12, 1926.

SEVENTIETH BIRTHDAY OF PROFESSOR KRAEPELIN

This year also marks the seventieth birthday of Professor Emil Kraepelin of Munich, formerly professor of Psychiatry in Heidelberg and Munich and now much interested in building up the Research Institute of Psychiatry in Munich since his retirement from his University Professorship. Professor Kraepelin's birthday was signalized in many ways. The *Zeitsch. f. d. g. Neurologie und Psychiatrie* published a *Festschrift*, as did also the *Allgemeine Zeitschrift f. Psychiatrie*. Professor Kraepelin has just returned from an American-Mexican trip studying Paresis among the negroes and Indians, and it is reported that his indefatigable industry is to take him to India this or next year to study psychiatric problems there. He is busy revising his *Lehrbuch*, as well as carrying on a series of studies in Industrial Psychology.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

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An American Journal of Neuropsychiatry, Founded in 1874

ORIGINAL ARTICLES

PSYCHOANALYSIS IN THEORY AND IN LIFE ¹

BY TRIGANT BURROW, M.D., PH.D.

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Now that the excitement following the inundation of psychoanalysis has died down and the clinical territories most affected have been once more built up and restocked, it is interesting to witness the changes wrought in different quarters as a result of the general havoc to habitual prepossessions. There is no question as we stand amid the debris of past conceptions but that the sudden descent upon us of Freud's postulates has destroyed many old landmarks that shall not be restored and that it has brought in a wealth of new material that has altered no little the configuration of the old.

As I happen to have been of those who were carried in upon the current of the general onswEEP of new interpretations ushered in by Freud, my experience forms the record of a reaction to that movement that is internal because from the vantage ground of a participant in it.

As the position to which I have gradually come differs to-day so essentially from the followers of Freud as well as from his dissenters, some account of the development through which my conceptions have passed may be of interest to others who, like myself, have earnestly tried to bring order and a permanent coherence out of the large mass of conceptions that cluster about Freud's dynamic idea, so many of which are of epoch-making significance in their envisagement of mental disharmonies, so many of which in being immature and

¹ The following essay is the introductory chapter of a larger work, to be subsequently published, representing the outcome of a practical experiment in group or social analysis.

unsound only obstruct the passage that Freud has contributed so splendidly to open.

The theory of psychoanalysis rests on the conception that nervous disorders are the substitutive manifestation of a repressed sexual life; its basic position is that this substitutive factor is responsible for neurotic processes and that it is the sexual impulse for which recourse is sought in the process of substitution. This position of psychoanalysis is in its essential significance now generally accepted—the position, namely, which affirms the factor of replacement as the essential account of nervous manifestations and posits the urge of the sexual instinct as the element replaced.

While with other psychoanalysts I am in full accord with this thesis, my finding in regard to the relation of these two propositions to one another is so entirely at variance with the prevailing psychoanalytic view, and alters so fundamentally for me the ultimate interpretation of psychoanalysis in its bearing upon the problems of consciousness, that I shall make clearer the ideas expressed in this essay if at the outset I may state briefly in what manner my interpretation of this relation differs from the accepted conception.

The difference lies in the fact that I do not regard this replacement as *primarily* a replacement for sexuality as we now know it. On the contrary sexuality, as manifested to-day amid the sophistications of civilization, is itself a replacement for the organic unity of personality arising naturally from the harmony of function that pertains biologically to the primary infant psyche. This original preconscious mode² I regard as the matrix of personality. The spontaneous process of the organism's unhindered growth through the gradual development of experience or awareness from this unitary mode as a basis is, in my interpretation, the meaning of consciousness. The whole meaning of sexuality on the other hand is substitution, compensation, repression. In a word, sexuality, as it has come to exist to-day, is identical with the unconscious, while a unification of personality is alone to be found through eliminating the recourses of substitution and sexuality and thus reuniting the elements of the conscious and organic modes now kept asunder through the interposition of the unconscious mind.

Hence the modern substitutions existing under the name of sexuality, whether repressed or indulged, are but a symptom of this organic denial of the inherent life of man. Sexuality is not only utterly

² The Preconscious or the Nest Instinct, paper by the author read at the seventh annual meeting of the American Psychoanalytic Association, Boston, Mass., May 25, 1917.

unrelated to sex but it is intrinsically exclusive of sex. Sex is life. It is life in its deepest inherency. Sex is the spontaneous expression of a natural hunger. In the instinct of sex there is felt a yearning from the depths of man's soul for mateship and reproduction, while sexuality is the personal coveting of momentary satisfaction in mere superficial sensation. By sexuality then I mean something very different from sex. I mean the restless, obsessive, overstimulated quest for temporary self-gratification that everywhere masquerades as sex and is everywhere substituted for the strong, simple, quiet flow of personality that unites the organic and the conscious life in a single stream and is the expression of personality in its native inherency.

With this altered conception other modifications have followed which necessarily entail a distinct departure from the accepted psycho-analytic position. As this organic denial and the restless compensations and substitutions comprising the unconscious are in essence the psychology of the mental reaction-average known as normality, it is no longer possible for me to accord with the popular analytic view which places a premium upon this manifestation of the collective unconscious and assigns the criterion of normality as the desired goal of adaptation for the neurotically repressed personality.

I cannot accept this view. For an analysis of the social unconscious shows that the collective reaction embodied in the adaptations commonly accepted as normal betrays a tendency to repression and replacement that is no less an indication of disease-process than is the reaction presented in the individual neurosis. Indeed, from the point of view of constructive consciousness and health, our so-called normality is of the two, in many respects, the less progressive type of reaction. For in truth many of our normal reactions, in evading the issues of the unconscious, envisage less the processes of growth and a larger consciousness than the neurotic type of reaction, which, however blind its motivation, at least comes to grips with the actualities of the unconscious mind.

It is the hall-mark of normality that, suspecting nothing, it takes itself completely for granted. In the spirit of true conformity, it accepts its expressions of the vicarious at their face value and assumes the burden of its self-inflicted compensations with entire complacency. The neurotic, on the other hand, at least senses the inherent discrepancy in his life. He at least demurs in so far as to withhold assent from the mass-compromise embodied in the substitutions and connivances of the social unconscious. In a word, it is the distinction of the neurotic personality that he is at least consciously and confessedly "nervous."

This, as far as I can see, is the chief distinction between the condition represented in normal adaptations and that represented in the neurosis. It is a distinction that lies merely in the greater weight of numbers. Normality in its numerical strength concedes acceptance to the average-reaction and so yields it right of way. In normality the unconscious carries the day, while in the neurosis it is pushed to the wall. The distinction psychologically lies in the successful compromise of the one as contrasted with the enforced doubt and self-questioning of the other. It is the compact security of the social polity on the one hand as compared with the more sensitive isolation and uncertainty of the individual unit on the other.

It is my position, therefore, that, from the point of view of life, many of our normal reactions are psychologically as truly a manifestation of the distorted and substitutive as are those more isolated manifestations we commonly stigmatize as neurotic disharmonies. I cannot see but that the element of the repressed and substitutive, on which is based Freud's theory of the neuroses, is an element that underlies the expression of consciousness in all phases of its manifestation and that hence underlies also the phase represented in normality. In brief, many so-called normal reactions too are nervous. Normality, too, since it is actuated no less from motives of the ulterior and vicarious, even though it supposedly represents the criterion of adult consciousness, is no less an expression of the distorted and symbolic. This distortion is to be seen upon every hand in the restless greed and self-seeking that underlie the national, industrial, political, social and religious possessivism and competition which are the typical psychology of the normal mind, notwithstanding its plausible exterior of human progress and universal good-will. Universality and good-will are not there. These are but the manifest symptoms represented by the social personality after it has undergone the distortion represented in the substitutive reactions characteristic of the societal neurosis, that is, after it has been subjected to the mechanism of diplomatic repression and modification. What is there in reality is the will-to-self and the particular aim which best serves the egoistic advantages of the individuals comprising the social unit in question. The mechanism is identical with that which underlies the individual neurosis, namely, the covert aim toward the satisfactions of self constitutive of unconsciousness.

Normality too, then, may be neurotic. Normality, too, may have its repressions and its substitutions, its secret symbols and equivocations. The difference is that as normality possesses the warrant of the institutionalized and current, it enjoys the protection of the con-

sensus. And just as the neurotic fails to comprehend the meaning of this vicarious manifestation in its individual expression within himself and is a prey to the inscrutable symptoms in which his organism finds its compensations, so we who are accounted normal as little suspect the meaning of this same symptomatology as it exists in its social expression within ourselves. The neurotic resolutely defends his unconscious duplicity behind an ingenious charade of unconscious symbolism, and we no less resolutely defend ours through recourse to an identical device. But if we will look beyond the narrower confine of the clinic and face squarely the logical issue of Freud's thesis, we cannot avoid the conclusion that it is an indictment of man's consciousness in its entirety. Hence normality, too, must make answer for its complicity in the unconscious ruse of substitution and evasion which we observe in its more intense reaction as the introversions of personality presented in the obviously arrested expression we call neurotic.

If anyone is disposed to question this view, let him consider but one symptomatic reaction recently manifested throughout the social organism. Could there be anywhere imagined an unconscious reaction more wasteful and destructive or one of wider scope or severer intensity than the symptom-reaction represented by the war that has recently convulsed the world? Or consider the equally unconscious expression presented in the tendency to religious emotionalism that has followed in its wake, with its corresponding effort towards compensation and self-propitiation through recourse to the sentimental and spiritualistic. Yet all the while the existence and the significance of the unconscious motives that are latent in the two extremes of emotional reaction underlying these manifest expressions have not yet begun to be suspected and reckoned with on any clear, conscious, analytic basis.

What then is the meaning of this tendency to substitution as shown in the reaction of the social as well as of the individual organism? If sexuality is the element substituted for, what is the psychology of this factor called sexuality? What is its meaning? In analyzing the unconscious of the neurotic personality it has become gradually clearer to me that the factor underlying and actuating the conflict Freud describes as repressed sexuality is nothing else than the personal desire of ascendancy or the lust of acquisition *concomitant with the organism's unconscious reversion upon its own image*.³

³ "Social Images versus Reality," *The Journal of Abnormal Psychology and Social Psychology*, Vol. XIX, No. 3, October-December, 1924.

Sexuality, then, is but a larger word for self. It is the effort to limit life to the ends of personal aggrandizement. It is the greed of the self-limited personality to compass the whole, as contrasted with the societal personality that is encompassed by the whole. But since the unconscious is the same under all forms, self or sexuality, with its pride of possession, its lust of gain, is no less the unconscious element underlying the psychology of the normal reaction-average. And precisely as in the individual reaction these unconscious wishes are manifested only in the disguised symbols and substitutive equivalents portrayed in neurotic symptoms, so too in the social organism these egoistic interests antagonistic to consciousness and growth venture to express themselves only in the corresponding substitutions of the mass unconscious.

Thus the unconscious represented in the social reaction we call normality is no whit different from the unconscious represented in the individual reaction observable as the neurosis. We are habitually deceived by the give-and-take policy of normal adaptation with its secret covenant of good manners and outward forms. But the apparent difference between the social and the individual neurosis consists merely in the fact that the poignancy of the conflict underlying the symptomatology of the social personality is largely mitigated and condoned by reason of the wider numerical distribution of the social organism and the consequent freer dissemination of the elements involved.

But, though of wider distribution, there underlies the expressions of normality no less of conflict and repression than exists in the acuter expression seen in the individual neurosis. In the personality of the more sensitive or affective type we think of as neurotic, this tendency to self-acquisitiveness or sexuality and its organic incompatibility with the quiet inherency of life become, as it were, stalled and impacted within him, while in the societal organism the discrepancy of personality occasioned by its sexuality or pride of ascendancy apparently entails no such organic blocking as that occurring in the individual. But the pain and impaction are present nevertheless and are betrayed no less in the recourse to the substitutive and symbolic, characteristic of our prevalent social hysteria, not to mention the more violent disorders that crash upon the world in the reactions of political and industrial dissension and in the fiercer paroxysms of war.

Such is the meaning of our so-called normality. To a degree that is quite unsuspected by us its psychology is unconsciousness, and the psychology of unconsciousness is the psychology of the self-image

secretly worshiped under the habitual guises of symbolism and replacement. It is time we should recognize that this recourse to the vicarious image is the psychology of many of the reactions of the normal as well as of the neurotic, that in ourselves no less than in the neurotic, there is the putting forward of that which *stands for*—the exploitation under countless different aspects of that which may be adroitly put *instead of* rather than the simple acceptance of that which *is*.

It is part of the purpose of the present study, however, to try to bring into clearer light a substitutive reaction that is much nearer home. As psychoanalysts, whether educational, sociological or medical, we need to take into account a distortive process that has a much closer bearing upon ourselves and our responsibility toward the problems of our common social consciousness. For of all the forms of substitution to which normality has recourse, the form that seems to me of deepest significance for us, and that presents the most vital need of analysis and understanding within ourselves, is the vicarious expression growing out of the tendency to an objective approach toward the problems of consciousness that has come to be embodied in the formulated *system* of psychoanalysis.⁴

In the whole symptomatology of normality with its societal expression of the vicarious there is no symptom-complex that is of greater significance than that embodied in the attempt to apply to the actuality of human life the *system* of human life offered in psychoanalysis as it is to-day interpreted and applied. For a system of psychoanalysis is itself but a substitution for life, a theory of life in place of life itself. The theory of psychoanalysis sets out with a premise; life does not. Psychoanalysis offers a solution; life is its own solution.

It is not theory as theory at which I demur; it is theory as application to the needs of human growth. From the point of view of the theory of psychoanalysis this therapeutic recourse in the treatment of nervous disorders seems to me completely adequate and true; but from the point of view of life I have come to regard the application of the system or theory of psychoanalysis to the problems of individual needs as an utterly futile procedure. I have come to feel that what is here of value in the textbook is utterly worthless in our daily relation to human personality.

I would not of course be understood as repudiating theory as such. Seen clearly as the extrinsic expression it is, theory undoubtedly has its place, but its place is not in the earnest relationship of one human being to another such as obtains in the confidence and

⁴ "The Laboratory Method in Psychoanalysis," *American Journal of Psychiatry*, Vol. V, No. 3, January, 1926.

communication offered in the actuality of psychoanalysis. It has not yet been recognized however that we who are psychoanalysts are ourselves theorists, that we also are very largely misled by an unconscious that is social, that we too are neurotic in so far as every expression but that of life in its native simplicity is neurotic. Our disharmony, however, is a phase of that widely diffused neurosis that exists under the prevailing social consensus represented in the normal adaptation. And so, as I now see it, there is no more subtle form of substitution or one that is more successful in its capacity to evade the censor of consciousness and obtain the stamp of genuineness than the symptom represented in the *theory* of the reactions of human beings as a replacement for the actuality of these reactions in life itself. Personal experience compels me to concede that it is such a symptom that is comprised in the theory of psychoanalysis as it is widely operative in the consultation rooms of psychoanalysts to-day.

It has been assumed that, in envisaging the unconscious, psychoanalysis presupposes a more inclusive position than is presumably characteristic of the theoretical or systematized clinician. But it is a far-reaching commentary upon the analyst's capacity of discrimination that he still presumes to analyze another on the basis of a system or theory, as though a neurosis which is an essentially subjective condition were of the nature of an objective bodily lesion. A dissociation within the personality may find its analogy in a bodily lesion but never a basis for its understanding. An objective analogy is necessarily a thing apart from a subjective dissociation. In the sphere of objectivity the formulated system or theory occupies a very different place. The theory of an objective phenomenon is entirely commensurate with its application. After all, the theory of a mechanism is but the description of the principle of its operation. In the objective world such an objective description presents no discrepancy. It is the application of the objective method to an objective principle. The theory of the hydraulic press is perfectly consistent with its application. Between theory and application there is here complete conjunction. No disparate element intervenes to mar the transition from the descriptive to the practical. So too with the theory of psychoanalysis as long as it pertains to the objective viewpoint of the textbook. But in the subjective sphere a totally different situation is presented. In dealing with life in its actuality, we are not dealing with the descriptive and objective. Human life is subjective. It is something experienced, something felt. It is not theoretical; it is actual. It is not descriptive; it is dynamic. Human life *is*; it is not a *theory* of what is. Life, as it is felt, is our ultimate

subjective actuality. Subjectivity or feeling is the very basis of life. As such, feeling is life's reality and no theory of feeling is an adequate substitute for this reality. And so the objective theory of psychoanalysis or the objective theory of the motives of human life is wholly inapplicable to the subjective experience or the actuality of human life as it is felt in individual personality.

We do not begin to reckon in the least understandingly with the nature of the subjective as contrasted with the objective sphere of life. We are, in fact, quite naïve in our attitude toward the whole subjective field, preferring to adopt toward it either a mood of beatific reverence and mysticism, in which we conjure unwarranted images of "psychic phenomena" that are allied with man's pseudo-religious vagaries, or we adopt a "scientific" attitude which repudiates as non-existent or regards as unworthy of serious thought any phenomena that do not lend themselves to objective observation. Neither position seems to me tenable. We may dismiss at once the attitude of the occultists, for mysticism entertains no argument. But there is the need to consider very seriously the subjective field of scientific reasoning and to keep clearly before us the distinctive and impassable interval between the subjective and the objective domains of scientific inquiry.⁵

The basis of this essay is precisely the recognition of this impossible breach between the condition of consciousness produced through a knowledge *about* feeling and the condition of consciousness that is the *feeling itself*, between the state of mind that is *commentative* and the state of mind that is *functioning*. The former is objective, the latter is subjective. The failure of our psychological methods to recognize this intrinsic distinction is to my mind the failure of our entire approach to the problems of mental and social disharmony. It is this unwitting substitution of the *theory* of human feelings for the unannotated experience of the feelings themselves as recorded in our interactive functioning as human beings that is the impossibility of our present "method" of psychoanalysis.

This position is for me an all-important one. Upon the acceptance or rejection of it, I believe, depends the growth or the decline of psychoanalysis as an agency of release for the intrinsic needs of the neurotic personality. To-day under the impetus of an objective psychoanalysis or of psychoanalysis in its theoretical or vicarious form, we are carrying theory to the point of absurdity. There is now, for example, the psychoanalytic theory of the nursery.

⁵ "Psychiatry as an Objective Science." *British Journal of Medical Psychology*, Vol. V, Part 4.

Anxious young mothers are running about looking for texts which will serve them as guides in the love of their children. They are diligently searching upon every hand for the latest approved theory of maternal love. And in response to the demand the popular literature is supplying them with full details. But there are no librettos of the nursery. Baedekers to motherhood are not to be had. The motherhood that is true is a subjective relationship, and it is only subjectively that it can be felt and understood.

I shall not forget the experience told me by a patient whose mother, actuated by the theory of motherhood in its highest "scientific" interpretation, undertook to enlighten her upon the significance of sex. The incident left the most painful impression upon her. The mother, having gathered courage for the performance of her maternal duty, delivered her errand with a punctiliousness which from the point of view of technique was irreproachable. She spoke out of the strictest regard for the theory of motherhood. But unfortunately her theory left out of account an item that needs to be reckoned with, namely, the native simplicity of the consciousness of childhood. The woman spoke out of the theory of a truth, but her child listened with the organic susceptibility of truth itself. The mother had not accepted within herself the actual significance of life, and so, in accordance with the formality of a theory, was vicariously imposing its acceptance upon her child. But childish perception pierces the veil of pedagogic finesse. The rigid demeanor of her instructor readily disclosed the discrepancy between the verbal recital and the utter lack of conscious acceptance within herself. For the child, now a middle-aged woman, the moment was an unforgettable one. She had witnessed in her mother an outrage to organic truth, and the shock of that experience caused a psychic disunity between mother and child from which there resulted an introversion of personality that covered half a lifetime. And so while the theory of the nursery is from the point of view of theory wholly irreproachable, it is from the point of view of the nursery wholly absurd.

It is a lesson which parents have yet to learn that the child is closer to the inherency of things than the grown-up—that the consciousness of childhood stands in a far more truthful relationship to the actuality of life as it is than the consciousness of the conventionalized and sophisticated adult. For years it has been my feeling that beneath the conflict of the neurotic personality there is reiterated an urge toward the expression of this primal inherency of consciousness. To-day it is more than ever my view that in the neurotic reaction there is expressed an inherent plea for the native simplicity

and truth of this organic consciousness. It becomes more and more clear to me that the pain of these personalities is due solely to the organic discrepancy of an unconsciousness and indirection within themselves, and that inherently their urge is to bring themselves again into harmony with the law of their being by reuniting the needs of their consciousness with the needs of their organic life.

As Nietzsche says: "May there not be—a question for alienists—neuroses of health?"⁶ This question for alienists is indeed a vital one but it is one which, as far as I am aware, has not as yet even dimly occurred to them. There is nowhere, it may be noted, a clearer argument for Nietzsche's hypothesis than Nietzsche's own neurosis. Unfortunately however alienists are still as little interested in the positive processes that bespeak the organism's conscious health, as physicians in general are interested in the positive processes that insure the organism's physical health. But as long as the collective social mind remains the collective unconscious mind it is not to be expected that we shall envisage the unconscious of the individual, in either its psychic or in its somatic aspect, from the basis of an inclusive consciousness and health. The question so often asked is whether insanity will ever become curable. The answer can only be that the insanity of the individual cannot be curable as long as there exists the insanity of the social mind about him. It is not humanly possible for the psychiatrist to remedy conditions of dissociation as long as he himself is part of a dissociated group mind.⁷

If the psychoanalyst, in applying to the lives of his patients a theory of life, is himself unconsciously resorting to the self-protection of the substitutive and symbolic; if the blocked personality of our patients meets with a blocking in ourselves, with a compromise, a theory, a something which stands as a *sign for* rather than that which *is*—a situation which offers a compromise mechanism identical with that for which they have sought aid from us—then clearly the way is not yet open for the release of the conflict within these personalities. For a patient may be only in so far untrammelled as the analyst is himself untrammelled.

In taking this attitude I do not make any personal claim for myself. This position is not one to which I have come through the success of my work but rather through its failure. For in the measure

⁶ Giebt es vielleicht—eine Frage für Irrenärzte—Neurosen der Gesundheit?—Nietzsche's Werke. Erste Abt., Band I. Die Geburt der Tragödie. Leipzig, 1903.

⁷ "Our Social Evasion," Presidential address before the mid-year meeting of the American Psychoanalytic Association, New York City, Dec. 27, 1925. To be published in a forthcoming issue of the Medical Journal and Record.

in which I have adhered to the dictates of a preconceived normality, in just that measure has my work defeated itself. Though I have for some time theoretically disavowed the mental status represented in the normal reaction, I have tended unconsciously all the while to ally myself with this standardized brand of unconsciousness and thus, in my own work, have inclined to hold to a theory of life rather than to its actuality. Not then with the neurotic alone but with us all it would seem that consciousness is mainly employed in efforts of self-protection and evasion. Truly, consciousness makes cowards of us all. But this is not consciousness in the sense of life and growth; it is consciousness in the sense of retention and self. It is not a free consciousness; it is consciousness with a reservation. It is not true consciousness; it is unconsciousness.

In accordance with such a mode of consciousness each of us is elbowing for a place for himself. Each is seeking more territory for his own expansion. Each of us is an unconscious overlord striving to secure the supremacy of his own personality. Universal and normal as this reaction is, its tendency is obsessive and ill. I do not believe that life is aggressive and that growth is concerned for itself. Personality is impersonality. What is needed is the quiet acceptance of life in its actuality. In it and it alone lies the opportunity for freedom and growth.

We hear much to-day of the technique of psychoanalysis. In truth there is no such thing. It is just another defense mechanism, just another resistance to life in its actuality. As in all instances of therapeutic specialization, the technique of psychoanalysis has become a fetish with us. It has become a veritable complex, a disorder from which I find patients actually suffering. The situation is quite ridiculous. The more I think of it, the more I am convinced that the so-called technique of psychoanalysis is but another hobgoblin wherewith the unconscious tendency of professionalism with its egoistic striving for preferment contrives to preserve its own separateness and distinction. I confess to having in my own unconsciousness more than once laid stress upon the importance of the analytic technique. But let us not be misled by what is called the technique of psychoanalysis. It is but another subterfuge for the reality of life. A technique of psychoanalysis is no more possible than a technique of love or of friendship or of motherhood. There is a technique and a very difficult technique of the *theory* of psychoanalysis. But that is quite a different thing. Psychoanalysis itself or, as its name implies, the loosening or freeing of consciousness is nothing else than the conscious acceptance of life. As such, it is the

exact contrary of the objective and technical. Life is not a technique. It does not express itself in terms of technique. Technique is an objective instrument. Life is a subjective experience. It is a joy or a sorrow, a disappointment or an aspiration, and it can no more be handled from the point of view of technique than it can be handled with the scalpel of the anatomist.

From these and similar reflections I have come to regard the formality of applying a system of psychoanalysis to the life of an individual as an actual hindrance rather than as an aid to the true expression of his personality. It is but an added repression. It blocks the very way it attempts to open. It is to meet the unconscious of a patient with unconsciousness within oneself. It is to answer symbolic substitution and indirection with the same substitution and indirection in an altered, more subtle, socially plausible form.

The whole meaning therefore of an analysis that is actual and not theoretical is the realization and acceptance on the part of the analyst of the utmost unconscious symbolization and distortion within himself. The analysis of a patient is the analysis of oneself. It cannot be otherwise. And when I say analysis, I do not mean an analysis that is a mere unconscious concession to normality—a giving vent to the egoistic erotism of the individual by diffusing it among the widely distributed elements of the social personality in the manifold distortions of sexuality. I mean an analysis of personality in its widest expression, an analysis through which the individual comes into the conscious acceptance not only of the repression or distortion that is personal and that is comprised within the individual introversion we know as the neurosis, but of the distortion or substitution of personality that is social and that constitutes the confederacy of unconsciousness popularly indorsed as normality.

It is my unhesitating position that the prime requisite for clear, free, untrammelled work in the analysis of human personality is the unqualified rejection of the unconscious compromise embodied in the social reaction of normality. Repudiating the attitude of the healer whose criterion is the restoration of his patient to a condition of normality, the medical analyst who is not himself capitulating to the concession of the social unconscious will take his stand against any recourse that is based upon a program of compromise and habituation. He will see that what is often considered as normality is merely unconsciousness on a coöperative basis and he will not be deceived by its insidious offers. It is only through such an attitude of complete freedom within oneself that it is possible to offer the opportunity of freedom to the personality of the neurotic patient, the very heart

of whose disharmony lies in an inherent repugnance, however bewildered and confused, to the untruth of the social unconscious comprising his milieu. Viewed analytically, normality can become but the self-flattery through which we pretend we are not unconscious. By so pretending however we are only furthering our tendency to deeper unconsciousness.

As long as there is self-protection, there is self-limitation; as long as there is self-limitation, we are necessarily setting a limitation to the possibility of growth and consciousness in our patients. It is only through rejecting such protection that we may come to accept the testimony of the unconscious within ourselves. Otherwise, we ourselves become the inhibitors rather than the liberators of consciousness; we who are psychoanalysts become mere guardians of disease-processes instead of the willing repositories of these unconscious factors as they exist in others, through our understanding and acceptance of these processes as they exist within ourselves. For consciousness grows upon the medium of consciousness. It cannot be nourished upon an extraneous soil. Theories of consciousness are extraneous. In the presence of the actuality of life, theories of life become mere intellectual snobbery. Being wise, sophisticated and remote, they are inadequate to meet life in its native simplicity. Bearing the testimonials of authority, the credentials of office, they do not come low enough. These insignia of rank only tend to intimidate personality in its inherent simplicity. What is needed for the release of the neurotic individual is the personality who imposes nothing of his own and thus allows the completest opportunity for the unfolding of the repressed and introverted personality of another.

But there enters here a consideration of vital importance and one that has not yet been adequately reckoned with and understood. If the psychoanalyst is to be the recipient, there must be those who stand to him as recipient also. If he is to understand, he must be understood. If the life of the analyst is to be a reality and not a system, he himself must in reality participate in the life in which he invites others to participate. If it is his thesis that human life cannot subsist alone, that communication is life, that it is the very meaning of consciousness, neither can he subsist without communication. And so there need to be in the life of the analyst the personalities with whom he may share, with whom he may communicate, who accept him and are accepted by him in turn. For to analyze is to be analyzed, to understand is to be understood.

These are conclusions to which I have not come alone. I could

not have. They are the outcome of my own opportunity of participation and expression, as the need of communication has come to unfold itself in my own experience.

It is needful, then, that we who stand as the promoters of a new and untrammelled consciousness look carefully into our own lives to discover whether we ourselves as part of the social consciousness are not theorists rather than unified personalities actuated solely by the law of understanding and of growth within ourselves. It is needful that we realize the completely vicarious and repressed element underlying the expression of unconsciousness embodied in the social unrest within and about us, and that, fearlessly repudiating this collective reaction of substitution and evasion, we break completely with the popular policies of compromise and untruth underlying it. In this course we shall take our stand for the freedom and clarity of a mode of consciousness that aims solely toward the growth of self-understanding and communication. For life is not a system, it is not a technique. Life is simple, and its course is one of quiet flow. In so far as psychoanalysis is technical, it is not life. In so far as its aim is the systematized, it is not free.

The choice is an unequivocal one. It is a choice between expediency and truth, between fixity and growth. For the habitual mind whose criterion is expedience the choice is already determined, but for the personality that is sensitive to the inherency of life, the choice of growth is no less inevitable. It is organically so. Hence it is for each of us to make his choice on which side he will take his stand—whether, adhering to a theory of life, he will blindly protect himself against the recognition and acknowledgment of the vicarious element of habituation and compromise within his own unconscious, or whether he will stand for a mode of consciousness that flings away every habitual protection and accepts only the conditions of life as they unfold themselves in the development of his own personality as well as in that of others. The outlook is really not ambiguous. The question is whether life will be a theory or system corroborated by the technical outfit of the clinic or whether it will be the deeply fulfilled experience that comprises consciousness in its organic reality.

To sum up. The definite biological concept on which this thesis rests posits a societally organismic continuum as the essential basis of consciousness. To understand this concept it will be necessary to replace the more or less arbitrary divergencies of personal outlook with a conception that attempts to stand far enough removed from our personal mode to envision within its more ample formulation this personal outlook as well. It will be necessary to recognize our

tendency to personalistic delimitation due to the unconscious systematization of the restricted individual unit and in this way to envisage consciousness anew from the more inclusive basis of its societal meaning. The activities of the small group with whom I have worked in association during the last years give promise of the inception of a more comprehensive psychoanalytic technique applicable to social units as well as to the single individual. Through the study and analysis of our human moods and complexes as actually observable within the reactions of groups there has at least been made a beginning of an actual laboratory approach to the study of our social consciousness.

INTERNATIONAL COMPARATIVE STATISTIC OF GENERAL PARESIS *

A PROGRAM AND REQUEST

By DR. KOLB

DIRECTOR OF THE INSANE ASYLUM OF ERLANGEN (BAVARIA)

Mr. Kolb has asked me to premise an accompanying word to the following publication. I readily comply with my colleague's request being sure that the exact knowledge of the frequency of general paresis in different countries as well as of their variations may give us an important explanation of the character and causes of general paresis. It would be of particular importance to state in an unfailing manner to what extent, and in what territories peoples still live where paresis does not occur at all, or only seldom. Chiefly, when in this occurrence, as it seems to be the case in various places, essential variations appear, it would evidently be possible to investigate the causes, which enable us to afford protection against the disease. This is a department in which all nations can coöperate in order to combat one of the greatest afflictions of mankind.

Münich, December 15, 1924.

KRAEPELIN.

PREFACE

The old proposition that general paresis may be reduced to "syphilization and civilization," is still justified. General paresis and tabes only arise when to syphilis a second factor being rooted in civilization is given. *One* etiologic quantity (X), formerly unknown, of the fatal equation "general paresis" has been found in the syphilitic infection. Now we come to the point to find out and to determine the *second* quantity or quantities (Y) unknown up to the present day. Many attempts have been made to determine this unknown (Y), but all previous interpretations are as yet far from being satisfactory. The greater number of psychiaters suppose a progressive factor which is thought to be connected with the development of occidental civilization.

Kraepelin especially has pointed to the varying frequency of paresis at various times and in various countries.

* Zeitschr. f. d. ges. Neur. u. Psych. J. Springer, Berlin, XCVI, p. 1.

It seems necessary to me to state by statistics the frequency of general paresis in the different countries for the longest period possible. This statement can be based upon the statistics of the different countries in connection with the reports of the mental hospitals. The comparison of the paresis curves of the different countries and capitals will allow us to state divergencies of the curve's course. Our task will be to investigate—for the periods in question—the factors which may be the cause of these divergencies. In short: I am endeavoring to obtain comparative international statistics of general paresis with a view to find out that factor (Y) being rooted in occidental civilization which has to combine with syphilis in order that parasymphilis develop in a particular case.

I am quite conscious of the difficulties and doubts which are almost insurmountable when we attempt to gain comparable results from various periods and various countries. In addition to that: The general paresis curve can duly be utilized only when we make ourselves acquainted with the frequency of syphilis. Only the Scandinavian countries, however, possess useful statistics of syphilis. In other countries we have to gain in an indirect way the data of the extension of syphilis. (Statement of the syphilitics treated in hospitals and clinics, deaths caused by syphilis, children dead-born or died in the first year, deaths caused by syphilis congenita, by aneurisms; utilization of the statistics of the sick funds as well as of the syphilitical statistics of the army and the navy mostly being very scrupulous; utilization of special censuses: Prussia 1900, capitals 1912, Melbourne, U. S. A., at the mobilization; serologic mass examinations of different groups not selected if possible, utilization of systematic examinations of dissected, etc.)

All difficulties may be overcome by controllable comparisons with the statistics of local mental hospitals. We are able to obtain an approximately true picture of the frequency of paresis as well as of the fluctuations in the frequency of different territories.

Important preparatory work has already been done by Kraepelin, Rüdin; Wiesel, Sweden; Hüni, Switzerland; Pilcz and Herschmann, Vienna; Heiberg, Copenhagen; Moreira, Brazil; Warnock, Abbasiya (Egypt); van Brero, Netherlandish East Indies; the reports of the mental hospitals of Santiago, Chile; the statistics of mortality in U. S. A., England, Italy; the excellent publication "Insane in institutions," 1910, by the Bureau of the Census, U. S. A.; the "medizinab-statistische Mitteilungen aus dem Reichsgesundheitsamt; the report of the Royal Commission of venereal diseases, 1916; the syphilitic statistics of the Scandinavian countries; the statistics of nearly all

civilized nations; the statistics of capitals, chiefly of Budapest, Montevideo and Buenos Aires.

I succeeded in elaborating the annexed provisional curves. In further treatises I intend to report on the most important scientific results that follow from the material I collected myself provisionally, with the reservation of comprehensive reëxamination by the competent experts of the various countries. Furthermore, I intend to discuss the occurrence of parasyphilis and syphilis in the various countries, and finally, to combine and classify the facts which may lead to the statement of the factor (Y).

A consummate result is solely to be expected in case that the psychiaters, neurologists, syphilologists, and statisticians of the different civilized nations interest themselves in this enterprise. They must rectify and complete the material of this treatise. Besides, they are to examine—out of the close knowledge of the situation of their own country—how civilization has influenced the curve and caused divergencies of its course from the paresis curves of other territories.

With these lines I solicit the coöperation of my colleagues as well as of the statistical boards and of the special press. I particularly request them that they furnish me with further material in order to make up the deficiencies, and to lengthen the curves both into the past and into the present time. Further I beg to have put at my disposal all reports utilizable for the purpose of statistics, or to inform me about them. All statistics containing indications of diseases and deaths caused by general paresis and ataxy locomotrice (detailed Bertillon statistics) as well as the above mentioned statements about syphilis are of import. It would be of particular value that as many insane institutions as possible would communicate to me for the longest periods possible all reports according to the following scheme:

Mental Hospital.....				Director			
Year	1. All first admissions	2. General paresis admissions,	(a) first (b) deaths	3. Population of the territory			
	male	female	male	female	male	female	female

with specification of the colored patients.

Analogous reports about syphilis and tabes furnished by hospitals would be most desirable. No less important are statements from the states and capitals of Central and South America, the East and West Indies, the Philippines, Korea, Formosa, China, and from Spanish and Italian capitals. As a matter of course, I shall endeavor to return as soon as possible the books and dissertations loaned to me. It would be of particular importance that in each territory (country, capital) both a psychiatrist and a statistician would enter

into relations with me in order to treat in coöperation with me the situation of their territory, or at least to exchange the material.

It would be an error to judge offhand of the frequency of paresis by the heights of the different curves. The statistics of asylum admissions for paresis present, if they only bear upon first admissions, higher numbers than the statistics of paretic deaths in asylums, the number of deaths by paresis in the whole country is superior to that of paretic deaths in asylums. The height of the paresis quota of the U. S., N. A., is essentially conditioned by the high paresis quota of foreign borns.

The intended publications shall furnish the reader with the material that enables him to inquire himself after the quantity (Y). For some years I believe I know the quantity (Y). The results obtained by the comparative statistics of paresis will lead other colleagues to the same hypothesis. I urgently beg these colleagues to inform before publication the "Deutsche Forschungsanstalt für Psychiatrie in München." He who comes to the same result as I myself will without further reason comprehend the present request. In conclusion, I wish to express my sincere thanks to Dr. Kraepelin Research of Munich, for having contributed towards the furtherance and to Dr. Plaut, professor in the German Institute for Psychiatrical of my work.

A CONTRIBUTION TO THE HISTOPATHOLOGY OF AMYOTROPHIC LATERAL SCLEROSIS

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It was found (Schroeder,¹ Hassin,² Naito,³ Büscher,⁴ Bertrand and Bogaert,⁵ and others) that in amyotrophic lateral sclerosis the motor cells of the cortex are more or less involved. In a carefully studied case of this disease Hassin showed that the anterior horn cells of the spinal cord as well as the bulbar nuclei are as much damaged as the motor cortical cells. In other words that the entire motor apparatus of the central nervous system, excepting the nuclei of the ocular nerves, are involved in a degenerative process.

I had the opportunity to examine the slides of the case published by Dr. Hassin and found the condition as described: marked cell destruction, neuronophagic phenomena, chromatolysis, and disappearance of the Betz cells. More or less marked in the motor, the foregoing changes were absent in the sensory ganglion cells. On the other hand, Alzheimer,⁶ in 1892 found in a case of progressive muscular atrophy cell changes not only in the anterior horns but also in the medulla and the motor cortex, while in bulbar paralysis, marked degeneration of the motor nuclei of the medulla were associated with such of the motor cortex and the anterior horn cells. One, therefore, is forced to an opinion that the changes in amyotrophic lateral sclerosis, bulbar paralysis and progressive muscular atrophy are essentially of the same character differing in intensity of certain areas involved.

It was proper to undertake a comparative study of various areas of the brain, medulla, and spinal cord, and contrast the findings with those in the motor cortex, with the view to ascertaining whether the changes in amyotrophic lateral sclerosis are confined to the motor cells of the cortex, medulla, and spinal cord. For this purpose two cases were studied, one of which was clinically a frank case of amyotrophic lateral sclerosis, and the other was a case of progressive bulbar paralysis. The studies of the second case for some reasons could not be finished and I shall give here a brief outline of the

findings in the case clinically diagnosed as amyotrophic lateral sclerosis.

CASE REPORT

A married man, age 39 years, of Polish descent was admitted to the Cook County Hospital on several occasions, April 11, 1919, July 12, 1919, and August 14, 1919. On each occasion he stayed but a few days and finally became an inmate of the Oak Forest Infirmary where he died April 27, 1921. A summary of the histories shows that when first admitted (April 1919) the patient had had difficulty in walking for the past six months and that it gradually grew worse. No other complaints were present at that time.

Examination: A well nourished man with spastic gait. The extremities, especially the hands and feet, were markedly atrophied; the muscles of the chest and upper extremities exhibited fibrillary twitchings which were also present in the tongue. He had some difficulty in protruding the latter but it did not show atrophy. The cranial nerves were all normal; neither the uvula nor soft palate or pharynx showed abnormalities. The tendon reflexes of both upper and lower extremities were all exaggerated; Babinski's sign was absent, but ankle and knee clonuses were present. Romberg's sign was absent. The abdominal and cremasteric reflexes were present but diminished. The visceral and genitourinary organs, heart, lungs and sensibility were normal. The Wassermann reaction with the blood and spinal fluid were negative. The condition, especially the atrophy and fibrillary twitchings were progressing and on reexamination, July 12, 1919, the arms and shoulders showed marked spasticity, weakness, and wasting, the gait was considerably worse, so that it was almost impossible for him to use his legs for locomotion. The left arm and the hand were more atrophied than the right. On August 14, 1919, the condition was the same and he was discharged November 5, 1919 to Oak Forest where he died April 27, 1921. The Oak Forest records show that in the last month he was bedridden and very untidy.

Microscopic Examination: The brain has been preserved in formaldehyde, and as it was somewhat badly cut up there was some difficulty in reconstructing it. It was delivered in such a condition to the laboratory from Oak Forest. Microscopic examination of various portions of the brain studied in celloidin, paraffin, and frozen sections and stained with toluidin blue, thionin, hematoxylineosin, Herzheimer, Alzheimer-Mann, and some with Ramon y Cajal's methods showed that the pia arachnoid layer was infiltrated throughout with lymphocytes, fibroblasts, and mesothelial cells which were particularly numerous. In much smaller numbers were present gitter cells filled with lipoids.

The cortex throughout showed a normal architecture, but the stratum zonale was somewhat larger than normally, while the external granular layer (the small pyramids) was reduced in size and excessively vascular-

ized. Excessive vascularization was also in evidence in the large pyramidal layer, the vessels being hyperemic, not infiltrated with hematogenous elements and in some instances there were new formed capillaries. The majority of the motor ganglion cells were devoid of structural changes and if present they were rather mild. Thus, their bodies, especially of the deeper layers, were often swollen, the processes deeply stained, tortuous with the nuclei centrally located and rich in chromatin. Betz cells were not found. The glia was represented by naked nuclei; occasionally cytoplasmic glia cells were present, that is to say the glia nuclei were surrounded in some instances by a rim of cytoplasm. These were especially found in specimens stained with the method of Alzheimer-Mann. Marked phenomena of satellitosis and neuronophagia were generally absent except for the deeper layers. Scarlet red specimens exhibited an abundance of lipoids in the ganglion, glia cells and especially in the adventitial spaces of the blood vessels. The nerve fibers showed no fragmentation or evidences of degeneration. The subcortical white matter was filled with hyperemic and a few newly formed vessels. Large amounts of lipoids were present in the adventitial spaces. In general the rather mild motor cell changes were associated with equally mild reactive phenomena on the part of the glia and practically normal nerve fibers. The rest of the areas, frontal, occipital, postcentral, temporal as well as the basal ganglia and pons also appeared practically normal. Only lipoids were abundant in the cortex especially in the perivascular spaces. The frontal lobe seemed to show a milder lipid accumulation than other areas. Perivascular infiltration with hematogenous elements were absent throughout the brain.

The medulla—In contrast to such insignificant findings in the motor cortex, the nuclei of the medulla showed more advanced changes. For instance the hypoglossal nucleus exhibited a greatly diminished number of ganglion cells associated with reactive phenomena—satellitosis, neuronophagia and cytoplasmic glia cells. Of the remaining ganglion cells many showed marked chromatolysis, diminution in size or atrophy, their processes were tortuous or stained densely. In addition there was a considerable vascularization of this nucleus; the blood vessels were hyperemic but not infiltrated.

The spinal cord—Marked as the changes in the medulla were, they were still more so in the spinal cord. With Weigert's stain the pyramidal tracts were degenerated. Here the fibers, stained with Bielschowsky, Alzheimer-Mann or both methods combined showed various stages of secondary degeneration as repeatedly described in experimental and human pathology. Many and in fact the majority of the nerve fibers when stained with the foregoing methods appeared practically normal. Some showed but early stages of degeneration with abundance of myeloclasts and myelophages, while others, comparatively few, were completely degenerated. The blood vessels showed thickened hyperplastic adventitia

containing numerous gitter cells packed with lipoids. Inflammatory phenomena such as lymphocytes or plasma cell infiltrations were, as in the brain and medulla, absent. The anterior and to a lesser degree the posterior horns showed an enormous vascularization. The blood vessels as well as the capillaries were not only excessive but also greatly engorged. However, lymphocytic or plasma cell infiltration was absent throughout the entire gray matter of the spinal cord. The anterior horns generally appeared diminished in size. Their cells were also reduced in volume and appeared shrunken. Their number was greatly diminished while the remaining cells had undergone various stages of degeneration from chromatolysis to cell sclerosis. The glia in contrast was proliferated showing as numerous nuclei and cytoplasmic glia cells. The foregoing cell changes were equally present throughout the cervical, dorsal and lumbar regions, probably more marked in the dorsal areas. In the cervical and lumbar regions the grouping of the ganglion cells was greatly changed and large masses of lipid substances were found within the ganglion and glia cells as well as in the adventitial spaces of the blood vessels and capillaries, but were practically absent in the posterior horn ganglion cells.

SUMMARY:

1. Reactive pia-arachnoid changes.
2. Marked degenerative changes in the cells of the anterior horns of the spinal cord, motor nuclei of the bulbus and to a lesser extent in the motor area of the cortex; practically none in the occipital, temporal and frontal lobes or in the posterior horns of the spinal cord.
3. Marked degenerative phenomena of some pyramidal tract fibers.
4. Accumulation of lipoids in the adventitial spaces of the blood vessels of the entire central nervous system and especially in the areas of the pyramidal tract fibers.
5. Absence of inflammatory phenomena.

DISCUSSION

More or less diffuse, the degenerative changes were as pointed out especially marked in the anterior horn cells and the pyramidal fibers. The majority of the latter, however, were, like the majority of the cortical motor cells, in apparently excellent condition. It is most likely that the degeneration of the nerve fibers corresponded with that of the ganglion cells quantitatively as well as qualitatively. In contrast the anterior horn cells appeared considerably more damaged in numbers and in degree, while the medulla was less so, though much more than the cortex. It is evident that the morbid process started in the motor apparatus of the spinal cord with a clinical picture of progressive muscular atrophy. The process gradually extended upward involving the motor cells of the medulla and some ganglion

cells of the motor cortex, causing secondary degeneration of the pyramidal fibers and resulting in a clinical picture of amyotrophic lateral sclerosis. The cortical cells probably became involved later, that is to say they did not have time to develop such marked structural changes as seen in the spinal cord. At any rate the process in this case was not inflammatory but a slow progressive degenerative one, affecting the motor system, especially that of the spinal cord and the medulla. Unfortunately it was impossible to elicit a detailed history, as the patient did not speak English. He stayed but a few days on each admission and did not give the proper coöperation.

The records of the Oak Forest Infirmary were pertaining to the last months of the patient's life and could not be therefore of much help. The remarkable feature is the presence of pronounced spastic phenomena, associated with rather mild pyramidal destruction which evidently corresponded with a mild lesion of the cortical motor system. The latter in this case was much less involved than in the typical case (amyotrophic lateral sclerosis) studied by Dr. Hassin, as the comparison of specimens showed. This might be due to the fact that Hassin's case was a much more advanced one. I should like to call attention to the absence of the Betz cells. The paracentral lobule as well as various areas of the motor cortex have been repeatedly studied by me and no Betz cells could be demonstrated.

Their absence pointed out by other investigators, of course may account for the pyramidal tract changes, yet glia proliferation in the paracentral lobule could not be found either. It is likely that the process was much more marked in the spinal cord, and began, as pointed out, as a progressive muscular atrophy and successively involved other motor elements resulting in a clinical picture of amyotrophic lateral sclerosis. This is evidently a pure motor neurone involvement and the difference between the foregoing two morbid conditions as well as bulbar paralysis may lie in the intensity of involvement of certain motor elements. If they are especially but not exclusively involved in the anterior horns of the spinal cord a clinical picture of progressive muscular atrophy will result; if in the medulla, that of bulbar paralysis will obtain, if the motor area of the cortex is also involved, we have a picture of amyotrophic lateral sclerosis.

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ON THE NATURE OF THE CREMASTERIC REFLEX

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The application of the evolutionary theory in the neuropathology throws light upon different clinical manifestations, and, what is still more important, permits us to conceive the biological nature of those clinical facts, which have not yet been thoroughly explained from the anatomical point of view.

The evolutionary method is already being successfully applied in the determination of disease symptoms, having arisen by the lesion in the central-motor-neuron. Professor M. Astwazaturow (1) gives us a perfect biogenetic analysis of the symptomatology in the pyramidal tract lesion, he also sets up a biological estimation of the hemiplegic contracture, of the deep and superficial reflexes and of the so-called pathological reflexes from the point of view of anthropogenic evolution.

This my investigation is based on the same principles, and endeavors to throw light on the nature of the cremaster reflex. We have long been able to convince ourselves, that in a lesion of the central-motor-neuron, *i.e.*, of the pyramidal tract, there is a disturbance of the two skin reflexes: abdominal and cremasteric. With hemiplegia or hemiparesis the abdominal reflexes are frequently absent on the affected side of the body or they are considerably decreased, whereas the cremasteric reflex shows only a slight difference, compared to the healthy side of the body; it is not so diminished, and even less often disappears completely on the affected side of the body. It is due to the frequency of these clinical observations on pyramidal tract lesion that we do not attach as great diagnostic importance of the cremaster reflex as we do to the abdominal reflex, the latter being a very good indicator of the slightest destruction in the pyramidal tract. We know further that one of the most important and earliest symptoms of disseminated sclerosis is manifested by the loss of the abdominal reflexes. (Strümpel and Müller, Brouwer, and others.)

Meanwhile, as numerous clinical observations have shown, the absence of the cremaster reflex in the same patients has been rare. This has also been mentioned by Hedde.(2) In some advanced

cases of disseminated sclerosis with definite pyramidal symptoms (spastic paralysis, pathological reflexes) it was observed that young patients with sound abdominal walls had a complete absence of any skin-abdominal reflex, whereas at the same time the cremaster reflex was present (however decreased). In other cases in the earlier stadium of disseminated sclerosis the upper abdominal reflexes alone could be provoked, while the middle and lower reflexes were already lost. The cremaster reflexes were however present, showing only a slight decrease in their intensity, but less exhaustion, than could be proved in the remaining upper abdominal reflexes. Apparently in disseminated sclerosis the middle and lower abdominal reflexes disappear earlier than the upper abdominal ones, and the cremaster reflexes remain long after the disappearance of all the abdominal reflexes, though in a dissolute state. Highly important for us is the fact of the conservation of the cremaster reflexes—when the abdominal reflexes with the same patient have already been lost—not their inequality, which may be observed even in the normal healthy man and which depends on the unequal development of m. cremaster and testis on both sides.

On the ground of these observations we may confirm that in pyramidal lesions involving the skin reflexes, the abdominal reflexes are the first to diminish or to disappear—before the cremaster reflexes, which are only slightly diminished on the affected side of the body and seldom disappear entirely. We state that all our investigations concern only the cremaster, but not the scrotal reflex, with which it must not be confounded.

The fact, that a marked lesion of the pyramidal tract affects the abdominal reflexes first, and more strongly, than the cremaster reflexes, is worth our attention, because both these skin reflexes—abdominal and cremaster—stand in close anatomic-physiological relation and must have an absolutely identical origin.

The peripheral parts of both arcs of abdominal and cremaster reflexes are distributed in the closest vicinity; *e.g.*, the reflex arcs of all the abdominal reflexes pass through the 7–12 dorsal segment, and that of the cremaster reflex through the first lumbar segment. For the upper abdominal reflex 7–8 dorsal segments are accepted and for the lower 10, 11, 12 d.s., for cremaster reflex 1–2 l.s. spinal cord. Their reflexogenic zones frequently overlap, like tiles or slate on a roof; this is predominant in the lower abdominal reflex. For instance, skin irritation in the hypogastric region (lower abdomi-

nal reflex) frequently provokes not only contraction in the lower region of the belly wall, but also the raise of the testis (cremaster reflex). On the other hand, by provoking the cremaster reflex—that is, irritating the inner side of the thigh—we also obtain muscle contraction in the hypogastric region (lower abdominal reflexes). Professor Bechterew even distinguishes an extra superinguinal reflex, manifested by contraction of the region of the oblique muscles above Poupart's ligaments, as consequence of the irritation or of the pricking of the inner side of the thigh. This reflex is generally obtained simultaneously with the raise of the testis, due to the cremaster muscle contraction (the latter consisting of some fibers of the oblique muscle).

There is something like a superaddition of one reflex to another, with reciprocal reinforcing influence. Therefore the dissolution of one of them, *e.g.*, of the cremaster reflex, may be caused by the loss of the reflex influence of the lower abdominal reflex when the latter is absent. Besides this reflex relation there may also be an influence upon the raise of the testis, provoked by the active contraction of the belly muscles, as it was shown by Wiedersheim.(3) He referred to the investigations made by Ammon. The latter has observed among recruits some strong individuals, who could raise their testis after some training and for this purpose first brought their abdominal muscles in contraction.

Based upon these anatomical relations, we might expect an identity in the changes of the abdominal and cremaster reflexes in pyramidal tract lesions which, however, as we have already seen, is not observed in reality. Consequently we must assume that the modifications above mentioned—the loss of the abdominal and the conservation of the cremaster reflex in pyramidal tract lesions—are not determined by anatomic-physiological relations but by other facts.

We shall try to find an explication, based upon the phylo- and ontogenetic evolution of these reflexes. It is important to note among the phylogenetic data, that mammals have no abdominal reflexes, whereof we could convince ourselves, when investigating domestic animals of different size. It is true, that they have something similar to an abdominal reflex (belly skin reflex), consisting of the contraction of muscle fibers, to be found in the skin covering the belly, the rib-bows, and the inguinal folds. This contraction may be provoked by passing the handle of a hammer or the finger over the surface of the skin. But that is not the same

reflex that we observe with men, where skin irritation really produces the contraction of the belly wall muscles. My neurological investigations with apes have also shown an absence of the abdominal reflexes (with macacus rhesus, mangoby), although morphologically and anatomically the abdominal muscles of their belly walls do not differ from the human ones (Sonntag).⁽⁴⁾

These phylogenetic data permit us to bring into connection the appearance of the abdominal reflexes with the acquirement of the vertical posture of the human body, *i.e.*, with the development of the act of standing and walking on the two feet. Only men walk in a vertical posture, apes use their four extremities, as fourhandlers. (The question on the nature of the abdominal reflexes has been treated more in detail by Professor Astwazaturow, to which the reader may refer.) It is also partly confirmed by ontogenetic data, where the appearance of the abdominal reflexes depends upon the acquirement of the vertical posture. We know that newborn children have no abdominal reflexes. These reflexes are elaborated in the second half of the first year, approximately in the 7th-8th month, this age being the period when the child learns to assume the sitting and standing position.

All the investigators (Strümpel, Müller, Monrad Krohn, Fuhrmann) express the opinion that the abdominal reflexes are only constant in grown-up people, especially in young individuals.

Fuhrmann (5) has investigated 500 children and notes that in the first half year's period the children have only inconstant abdominal reflexes.

As to the cremaster reflexes among mammals, they are constant with the stallion, what I could observe in provoking the raise of the testis, by irritating the inner surface of the stallion's haunch. More constant is the scrotal reflex, which we always obtained with stallions, bulls, dogs by the painful irritation, when pricking the scrotum, which excited a vermicular contraction. The cremaster reflex in men is very constant, being absent only in 2 per cent (Schönborn).

From the 252 investigated boys in the age from 1 day to 10 years, Fuhrmann has found that 8 had no cremaster reflex whatever (*i.e.*, 3.17 per cent); from the 40 newborn at the age from 1 day to 1 week only 3 had no cremaster reflex, 17 were of premature birth by one month, and only 2 of them had no cremaster reflex.

The results of our own experiments with 60 newborn boys are given in the following table:

TABLE

Age	Number of Observations	<i>Cremaster Reflexes</i>		<i>Abdominal Reflexes</i>	
		Present	Absent	Present	Absent
Below 1 day	2	2	2
1 day	7	4	3	..	7
2 days.....	15	11	4	..	15
3 days.....	14	13	1	..	14
4 days.....	17	9	8	1(?)	16
5 days.....	3	3	3
6 days.....	2	2	2
Total....	60	44(73.3%)	16(26.7%)	1(?)	59

These observations were made in a lying-in hospital, the "Snegireff Institute," Leningrad.

Among those investigated, 6 were of premature birth, 1 one day old, 3 two days old, 2 three days old; of these 6 three had vivid cremaster reflexes.

The greater percentage in the absence of the cremaster reflexes, compared to the other authors, may be attributed to external conditions, as *e.g.*, when the skin is moistened by the urine, a frequent case with infants, the cooling of the body, and the high posture of the testis, or its absence in the scrotum (Aronovitch).(6)

The investigations of the other authors, as well as my own, allow us to acknowledge that from the ontogenetic point of view, the cremaster reflex is doubtless an earlier and therefore an older reflex than the abdominal one. Evidently the child is born with cremaster reflexes, not yet having abdominal reflexes. These it acquires during the second half year's period of its life. This is also a reason for a greater constancy of the cremaster reflexes than of the abdominal reflexes in earliest infancy. Consequently, belonging to the same group of superficial or skin reflexes and being in a certain anatomic-physiological relation, the cremaster reflex nevertheless differs from the abdominal reflex by a higher phylo- and ontogenetical antiquity. I repeat, the cremaster reflex is older in its origin. Perhaps the difference in the phylo-onto-genetical antiquity of these two skin reflexes is the reason for the unequal changes in the intensity of the cremaster and abdominal reflexes in pyramidal lesions. In the process of the evolution regress, which arises in the pyramidal symptoms, the loss of our reactions and reflexes apparently proceed in the order of their phylo- and ontogenetical antiquity. At first the new acquirements, accomplished during the individual life are lost—hence at first the disappearance of the abdominal reflexes in the pyramidal lesion, then follow the changes of those acquirements, which were obtained earlier and are there-

fore older (cremaster reflexes). In the contraction of the muscle cremaster (levator testis) we find a rudiment of an old function: the faculty to raise and to drop the testis (observed in some mammals: gnawers and insectivorous). (Wiedersheim).

Thus the explanation of the above mentioned clinical facts from the bioevolutionary point of view is given, and I wish to emphasize once more the possibility of applying the evolutionary theory for explaining clinical symptoms.

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POSTENCEPHALITIC RESPIRATORY DISORDERS
REVIEW OF THE SYNDROMY, CASE REPORTS AND DISCUSSION

BY SMITH ELY JELLIFFE, M.D., PH.D.

OF NEW YORK

(Continued from page 166)

PART III

PHENOMENOLOGY AND PATHOLOGICAL
CONSIDERATIONS

A complete analysis of the phenomenology of this disordered type of respiratory behavior will not be attempted here. Such would involve physico-chemical, physiological and psychical considerations, utilizing the level hypothesis originally suggested by v. Baer in his recapitulation theory, favored by Hughlings Jackson, more completely elaborated by v. Monakow and followed by Jelliffe and White in their *Diseases of the Nervous System* (see Introduction, Fourth Edit., 1923).

Physico-chemical studies along these lines are certainly as yet quite incomplete, important though they may be, especially for the understanding of a number of metabolic phenomena observed in these encephalitis cases. The knowledge of the highly intricate correlations of vegetative neurology and metabolism variations are but in their beginnings in the study of the *Biology of the Individual*.¹

We here contemplate but a brief review of certain patho-physiological situations and a tentative entrance into the psychical coördinates in the effort to bring a possible monistic attitude to bear upon the comprehension of the picture of the *respiratory behavior*.

Inasmuch as the mode of approach is mechanistic rather than nosological such terms as hysterical, degenerate, dementia, psychopathic, etc., are of no particular significance here.

In previous pages I have tried to give a résumé of the chief available studies. I do not claim to have found them all, but those quoted are the essential ones. Some of these are of special value

¹ Brugsch u. Levy. *Biologie der Person*. Urban u. Schwarzenberg, Berlin and Vienna, 1926. Laignel-Lavastine. *Pathologie du Sympathique*. Alcan, Paris. 1924. Jelliffe and White, *Diseases of the Nervous System*, Ed. 4. Pottenger, *Symptoms of Visceral Disease*, 3d Ed. Adolph Meyer, L. F. Barker, etc.

for our problem in that the respiratory movements have been observed in greater or lesser detail and graphically represented by the methods at present in vogue. They are naturally very uneven in their detail.

The earlier studies concerned themselves with the acute respiratory syndromes. These are here put aside for the consideration of the residual or chronic forms with which this study deals. These acute manifestations are not to be neglected by any means as many pathological studies show that death has resulted from involvement of the essential respiratory neural mechanisms (Goldflam et al.), and hence, inferentially, in the residual respiratory disorders which are strictly homologizable with the acute respiratory syndromes, some impingement upon these complicated mechanisms must be admitted as playing a part in the residual types under specific consideration.

Furthermore it is believed that the muscular anomalies of respiration are in many ways to be coördinated with other muscular anomalies of the larger encephalitic syndrome. Achard (p. 57) has drawn attention to the similarities of myoclonic diaphragmatic breathing to other myoclonias. Similarly Cheyne-Stokes breathing with its usually lethal outcome and Mendicini's interesting initial pneumographic study of breathing anomalies in the acute stages show striking similarities in the residual syndromes. Thus Reys¹ in his interesting study has called attention to the myoclonic expiratory form as a residual in a succinct manner paralleled in our Case 2.

Turner and Critchley, to first take up the most recent of the studies in the respiratory phenomena have followed G. Lévy's classification with slight modifications. Thus:

(1) *Disorders of Respiratory Rate (Tachypnea and bradypnea).*

In Lévy grouping. (1) Respiratory Disorders proper. Alterations of rhythm—polypnea chiefly (tachypnea is preferred by T. & C.) bradypnea, apnea, accessory periodic respiration.

(2) *Dysrhythmias or disorders of Respiratory Rhythm* (Cheyne-Stokes, breath holding spells, sighs, forced or noisy expiration, inversion of the inspiration-expiration ratio).

(3) *Respiratory Tics* (Yawning, hiccough, spasmodic cough, sniffing).

Any combination of the above types may co-exist with or without the other sequels of encephalitis (T. & C.). To this we agree save that we have yet to observe a single case of pure respiratory disturbance which does not show some one or more of the now accredited to be "encephalitis" signs. Should we find such a respira-

¹ Reys, L. L'Encéphalite épidémique. Paris, 1922.

tory syndromy absolutely pure we would not necessarily exclude an "encephalitic" causal factor but would be inclined to hunt psychoanalytically for a characteristic psychogenic goal and hence ally such a case with the purer symbolic types.

Bériel's study, elaborated in Hardoin's early thesis (1921) affords us, historically, with the first intimation of explanation of the altered breathing, hence we will discuss micropnea before polypnea. After illustrating respiratory tics, they speak of a special form of *micropnea*

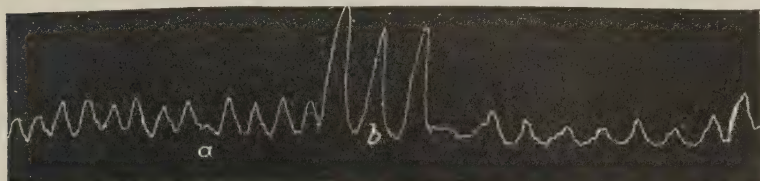


Abb. 4. (a) Mikropnoe; (b) Seufzer.

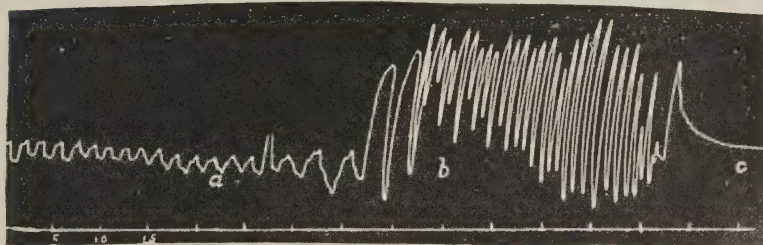


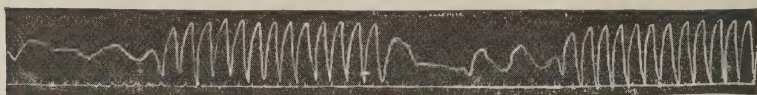
Abb. 5. (a) Mikropnoe; (b) Tachypnoe; (c) Apnoe.
Characteristic respiratory curves (Suckow).

in parkinsonian cases in which the respirations are rapid and superficial the diaphragm alone being in activity. There is no paralysis and Hardoin says neither central nor peripheral neural processes are involved. The essential feature is the thoracic rigidity which is allied by them with parkinsonian rigidity. Furthermore the tic-like brusque movements Hardoin correlates with a diaphragmatic myoclonic spasm or an accident of compensation arising in the course of the micropnea. These are related by him to some somatic disturbance. Gamble, Pepper and Muller's interesting experiment, already cited (J. N. & M. D., p. 610), make this improbable. Suckow's interesting paper further illustrates this micropnea in alternation with tachypnea, apnea, and with yawning episodes (see illustration).

Bulbar involvements are not probable; paralyses of the intercostals, diaphragm, pneumogastric are equally to be excluded. Superior centers of coördination such as lie in the corpora striata may possibly be involved but the author passes this by lightly and formulates the hypothesis already mentioned that of thoracic rigidity of a nature allied to parkinsonian rigidity. Radioscopic study showed complete immobilization of the base of the thorax. Thus as Bériel has pointed out other micromotor syndromies find their analogues in this micropnea, micrographia, minimal movements of the jaws, and other associated micromuscular activities.

The acceleration is according to Bériel a compensatory process founded upon oxygen need and therefore the diaphragmatic exaggerations in liaison with the thoracic fixation. Bulbar implications are not of help in the explanations, but Hardoin admits that higher coördinates—corpora striata—may be implicated.

That Bériel and Hardoin's point of view has partial validity for



—*Polypnée permanente*. 48 respirations par minute. Raccourcissement de la période d'expiration. Disparition de la polypnée et même ralentissement respiratoire pendant l'écriture.

Mlle. G. Lévy's illustration of persistent tachypnea. During writing the breathing alters, as also see Hardoin's curves of change in breathing during swallowing (Lévy, fig. 31, p. 142—Doin).

certain of these cases is concurred in and it is certainly a part of the present task to learn if possible more of the complex mechanism of respiration not only in its purely oxidative function but also as to the relations of chest and diaphragmatic movement as carriers for higher symbolic equivalents with which we are fairly well acquainted in their speech mechanism activities.

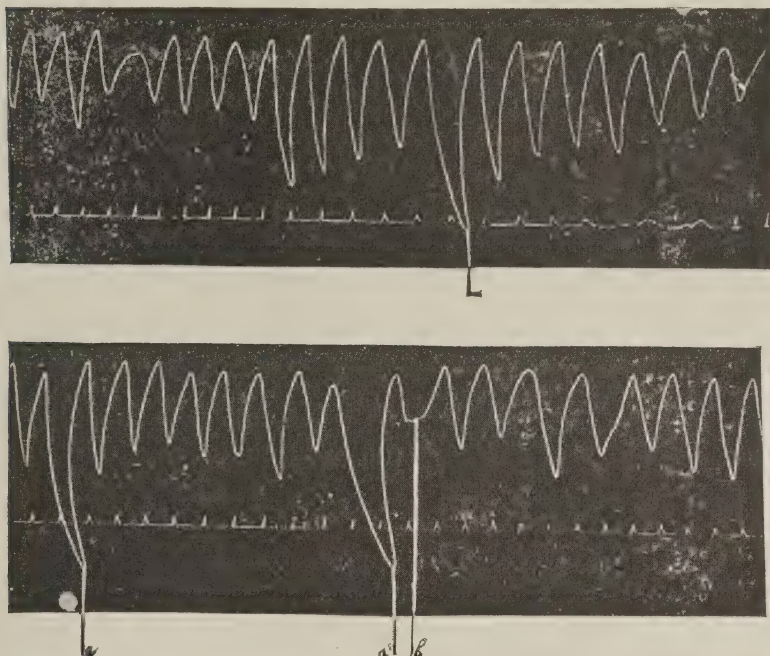
Laiguel-Lavastine and his assistants have also demonstrated an asynergia in the automatic respiratory movements with a dissociation between the right and left halves of the diaphragm.

Tachypnea. Turner and Critchley discard Lévy's much used term polypnea entirely although they follow her general descriptive outline.

Tachypnea (T. & C.), polypnea or tachypnea (L.) is the commonest of the respiratory anomalies—(the most important—L.). It may be permanent or paroxysmal, during sleep or only during the waking hours. We have observed both but in cases I and II here outlined it was present only during the waking hours—save in

a few instances of half sleep when it was continuous in both the cases here reported.

Turner and Critchley state there may be no cyanosis—in both of the cases reported by us here there were apneic periods with cyanosis and most of the case histories here given in abstract report the occurrence of an apneic phase with trance-like states or semi-unconscious phases. Turner and Critchley speak of the patients



Irregular tachypnea with sighing, deep dip in graphic. In lower figure tendency to irregular breathing with sighing. Same patient as previous graphic (Lévy, *Manifestations Tardives*, figs. 31, 32, p. 143).

usually suffering no inconvenience. Such has not been our experience in the numerous cases we have seen in various countries and in various clinics, where nearly all have complained of great inconvenience and of *intense effort trying to get their breath*.

The fixation of the chest as observed by Bériel and Hardoin obtains according to Turner and Critchley in the parkinsonian cases only. Such also has been our experience. It is notable in our Case II.

Paroxysmal (polypnea) tachypnea according to Lévy is the most frequent type—this has been our experience and the historical résumé bears this out. Lévy lays stress upon the “towards evening” occur-

rence of these attacks and Turner and Critchley speak of it also, when the attacks may last from a few minutes to several hours. In the cases here abstracted no determiners were really intelligently sought for. Lévy states that this evening oncoming situation was particularly true for children and often lasted all night. Our own experience has not dealt with children save that the psychical reduction universally present makes all of these patients children. That certain symbolic determiners are present is our belief; of this later.

The breathing attacks according to most observers are under some sort of voluntary control. Emotional stimuli are of much moment in inducing or modifying them. Turner and Critchley state that eating may stop them (see Hardoin curve for deglutition). In our cases I and II eating time was a particularly efficient stimulus in

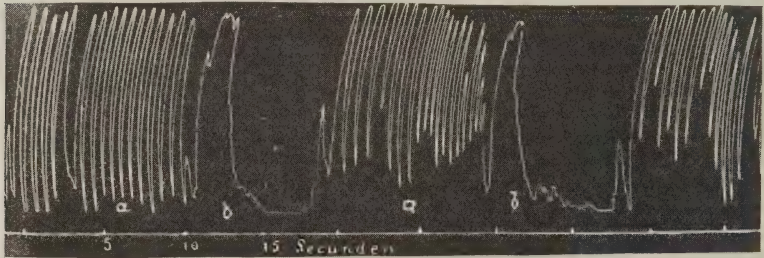
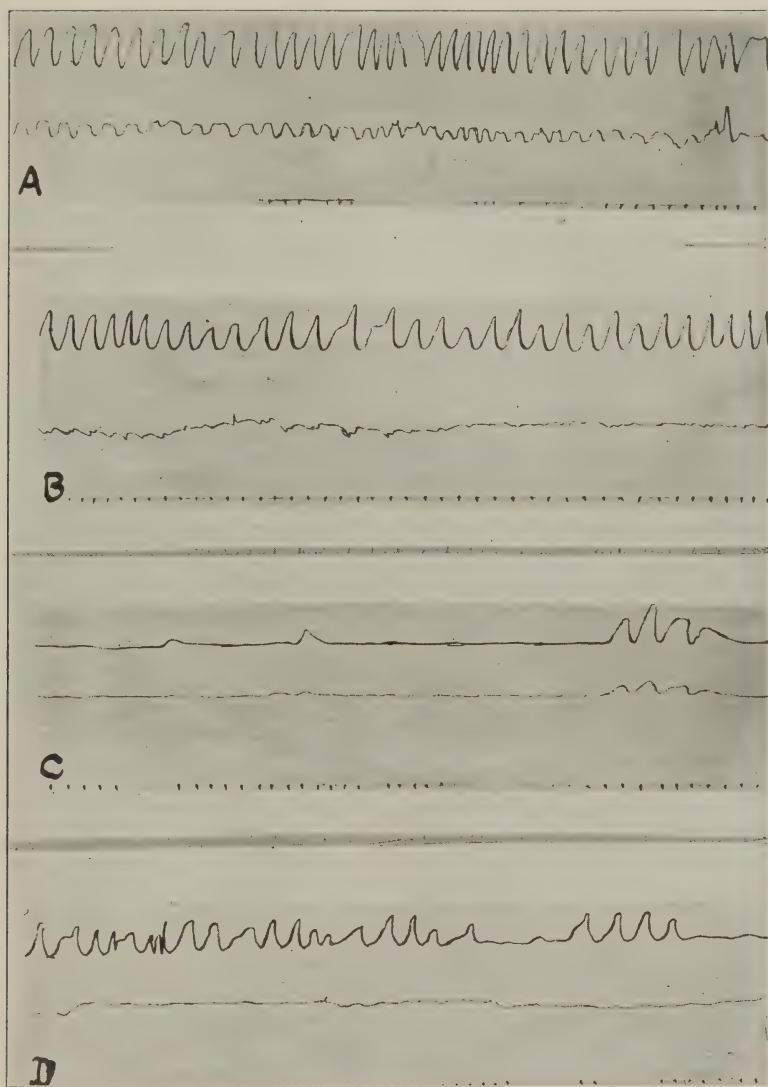


Abb. 7. (a) Tachypnoe; (b) Apnoe.
Type of alternating tachypnea and apnea (Suckow).

inducing them. Paroxysmal or permanent tachypnea seem to be quantitative grades in our experience. As the patients recover, for reasons as yet inexplicable (save for those here advanced as for some recoveries) the permanent types tend to give way to paroxysmal types, and such a course argues for beginning partial or complete recovery. Turner and Critchley call attention to Buzzard's observation concerning the dissociation of many complicated activities in encephalitis during which purely automatic activities such as swallowing, speaking, breathing, etc., seem to be split and only become possible under directed voluntary activity. This feature of functional dissociation is of much significance from the genetic point of view of behavior to be here developed more in extenso.

Attention has been called to the tetaniform complications of the hyperventilation of the lungs in the paroxysmal and permanent tachypneas. The observations are old although Barker and Sprunt would speak of their findings as new. These have been dealt with in the opening paragraphs of this résumé and inasmuch as it bears



CASE II. Miss Y. A. Phase of tachypnea in which thoracic (upper line) and diaphragmatic (lower line) muscles are synchronously involved.

B. Tachypneic and gasping respirations with irregular diaphragmatic movements. Not myoclonic however.

C. Apneic phase with yawning respirations at end.

D. Irregular yawning and gasping with diaphragmatic dissociation.

specifically upon the chemical problems involved cannot be entered into here even though we are inclined to feel that far reaching situations are involved. Adlersberg and Porges have offered an introductory chapter into this and it must be left here.

Our case II offered an exquisite example of what has been described as a persistent tachypnea—yet here it was evident that periodicity was present. Our reading of the many cases tends to make us believe there is no really permanent tachypnea. Even in the cases cited by Lévy and in her pneumographic traces there is evidence of a certain periodicity. There is a rise and fall, and attacks can be separated even though the interval seems slight at times. Suckow's tracings show some very striking alternate apneic and tachypneic attacks.

In our case II which is one of the most severe we have seen there would be 5-, 10-, 15-minute intervals between attacks—apparently related to diversion or other incidents. Here chiefly the attack would terminate with one or more deep yawns—which were accompanied by a feeling of deep satisfaction. Failing such satisfaction the breathing would go on. With a satisfactory deep yawn after

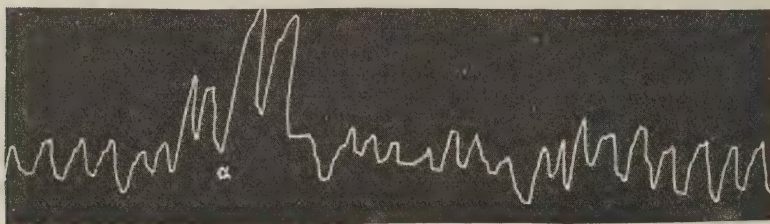


Abb. 2. (a) Seufzer.
Sighing, yawning respiratory curve (Suckow).

several smaller ones—the patient would either enter an apneic phase with increasing cyanosis or be free for a while—(the psychoanalytic correlation with an orgasm [sialorrheal or leucorrhoeal discharge] was quite evident in this case and will be discussed later).

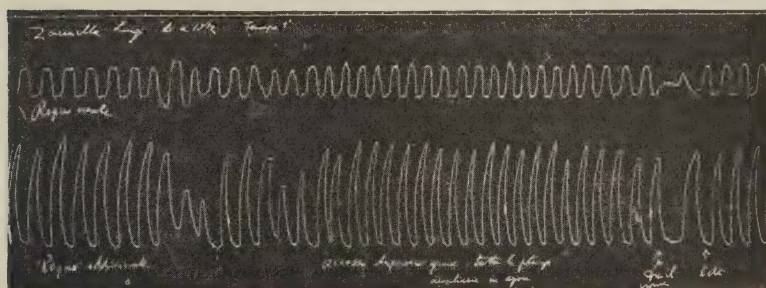
Lévy groups these sighing, yawning episodes with the tachypneas: Turner and Critchley speak of them as belonging in their second group. To us they belong with the whole unconscious mechanism and are of special significance when one views the whole situation teleologically. As no one but ourselves, Witzel and Runge have dealt with this phase of the pathopsychophysiological situation we reserve our discussion of these until later and will here indicate the descriptive phases only.

Turner and Critchley speak of these sighs as extremely frequent. Suckow has dwelt upon them at length. Most observers describe them as occurring in normal breathing followed by a short period of compensatory expiratory apnea. This apneic situation is to us of

great psychological significance especially when considered from the psychoanalytic viewpoint of early libido distribution between breathing and sucking in the infant. Turner and Critchley speak of them as occurring only during sleep or following slight exertion. This is not our experience.

Tic-like grimaces (T. & C.) spasms (L.) are noted. "Shivers" were present in both of our cases—and homologized to the involuntary "shudders" often experienced when the bladder is emptied, etc. (orgasmic analogues—envisaged by us).

Apneic phases are well described by Turner and Critchley and by Lévy, Bilancioni and Fumarola and were marked in our patients. With our cases they are clearly homologized with "unconscious"



CASE 5. Frequent, panting, irregular breathing correlated with psychical factors of distraction or of stuporous make believe (Bilancioni et Fumarola, p. 22).

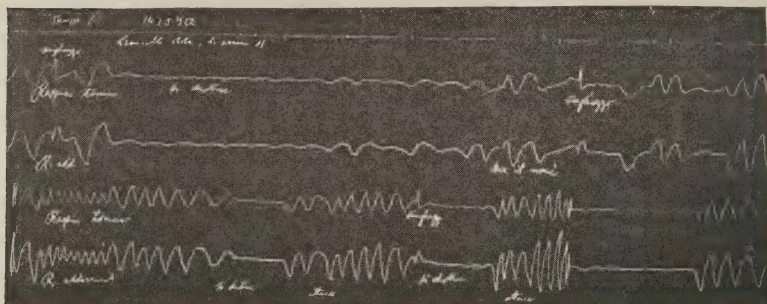
situations of rapt attention—"trance" (B. & F.) and our analysis shows their homology with enraptured and trance states as seen in narcoleptic, hypnoleptic, cataleptic, pyknoleptic, epileptic situations. Here are a series of dissociated phenomena of great interest and complexity which run back to infantile fixations of rapt interest—in which artistic intuition of the significance of the "Transfiguration"—"Danae"—"Leda and the Swan" not to mention many variants from the upper reaches of spiritual transport to the lower grades of erotic behavior are to be evaluated.

It is not to be inferred that such trance-like states are necessarily so correlated. In common sense terms "every tub stands on its own bottom" and hence only detailed study of the individual patient can determine the exact situation. Our own attention has been directed to such individual teleologies and of these we shall speak later.

Irregular respiration, bigeminal and trigeminal, dissociated costal, thoracic, nasal, or laryngeal types are frequently met with. It is

probable that these modifications each in turn have their special significance. Van Bogaert has studied these minor variations here in detail and speaks of alternating types as well as bigeminal and trigeminal types. Our own experience shows that all of these types are present but rarely in any stereotyped form. The gradual running down of a breathing attack is often very striking. Van Bogaert has charted some of these and shows that bigeminal and trigeminal breathing often issues in the apneic phase of an attack. Our cases frequently showed this. Van Bogaert speaks of changes in the tachypnea occurring from changes in position.

The personality make-up is probably of considerable significance.



CASE 9. See previous tracing. In this period the patient falls easily into a stuporous state, semi-ecstatic, in which the respiratory movements are reduced to a minimum. In the two lower graphic tracings the patient shows frequent attacks of dyspnea alternating with pauses, the former arising without apparent cause (Bilancioni e Fumarola, p. 40).

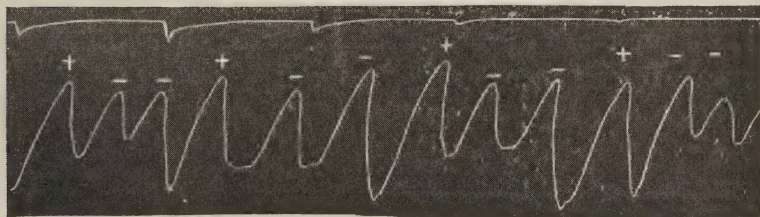
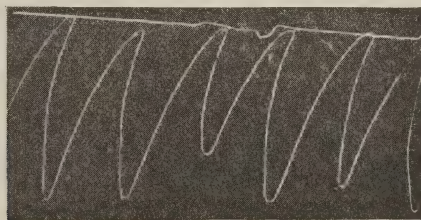
There is little available evidence upon this point but students of speech, of singing, etc., are well acquainted with such variations as pertaining to such backgrounds. Bilancioni and Fumarola's important contribution discusses these laryngeal and related features extensively.

In our case II for instance the prolonged expiratory phase corresponds with other breathing situations. She always had a tendency to discharge her speech explosively, and this feature is quite pronounced when she would smoke a cigarette. Whereas in many individual smokers, inhalation is most pleasurable, with her strong exhalation was the preferred type of activity.

As one studies the many pneumographic tracings on record these irregular types are plainly in evidence, at times in almost all cases, even though a predominant breathing pattern tends to be followed

in each individual. Bilancioni and Fumarola's tracings are especially interesting from this angle. Two of them are here produced.

Turner and Critchley emphasize breath-holding episodes. They here refer to those who hold the breath in deep inspiration. "These paroxysms are ushered in by a series of deep, forced inspiratory efforts with noisy expirations: the patients feel dizzy," or as if there were something in the chest interfering with full inspiration. A very deep inspiration is then taken and maintained for a period of ten, twenty or thirty seconds. Choreo-athetoid movements, grimaces or bizarre movements may accompany these. Sometimes consciousness is cloudy during such as in their cases 1 and 5 and our case I.



Respiratory arrhythmia with alternating type above and below fragment of a trigeminal type (Van Bogaert).

Our own cases showed a partial reversal of this formula. The patients simply stopped breathing. Case I would go into a trance sometimes lasting a long time, 5 minutes with cyanosis, cold extremities, tetaniform cramps in hands and feet and as recorded a few almost epileptiform states. Case II would stop breathing, become cyanotic after a few great yawns, then after 5 to 30 seconds start on her labored breathing. If the yawn was "satisfactory" the apneic phase might be omitted and she would talk for from 5 to 15 minutes, sometimes even longer, and then another paroxysm would supervene. With her there was some subtle interrelation between something obtained by the yawn and by the apnea. The better the yawn, the less

the apnea. Shivering attacks sometimes would follow an apnea, but rarely occurred when there was a good yawn.

A somewhat similar series of displacements was also seen in case I. The wish to micturate and these shivering attacks were in some way correlated as well. Lévy (p. 145) has called attention to involuntary micturition in one of her cases associated with spasmodic cough. Case I of our series would go to the toilet after a severe breathing spell. Wimmer's case 12 (p. 73) had nocturnal enuresis for many years previously.

The behavior of other patients during these breathing spells deserves a special chapter and cannot be here detailed. Only Runge's case will be cited in that the attempt to strangle himself should be brought into relief as possibly throwing some light upon the apneic situation. As apnea might be thought of as a special mode of strangling (self-destruction wish), Runge's theological student with his "ideas of sin"—also present in our case II in a modified manner—is thought of as deserving special comment and possibly to be related to the psychopathology of certain of these cases.

The Roch-Schmidt case who tried to hide, and others who banged themselves on the floor might also be brought alongside of the regressive suicidal wish-phantasy situation. Runge's case is deserving of more extended study here and also Hauptmann's extensive autobiographic case.

A final word may be said concerning the minor respiratory phenomena classed by Lévy, Turner and Critchley and others as tics. Bignami¹ as early as 1920 drew attention to these and allied them with the Dubini's electric choreas.

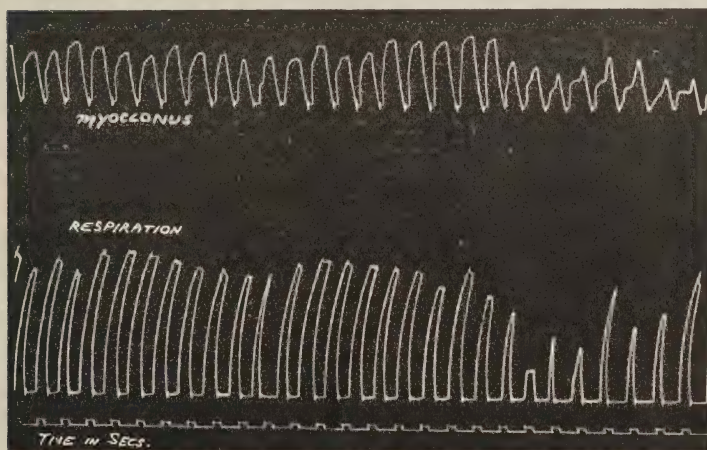
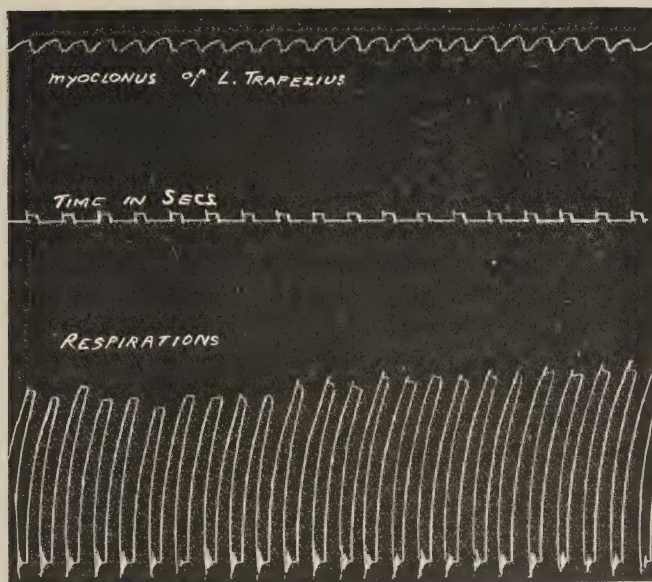
Zingerle² and others, as already noted, have allied them with diaphragmatic myoclonias. Since this enters into the large group of hiccough cases (see Wimmer, p. 73) with Turner and Critchley we leave them with a mention only save noting the interesting myoclonic diaphragmatic tic case of Gamble, Pepper and Muller.

Other nose sniffing and mouth blowing tics are also omitted full mention here. Lévy, Francioni, Parker, Babinski and Charpentier and others note them. The nose sniffing attacks were very pronounced in our case I and led to a nasal operation.

Wimmer (p. 70 et seq.) has dealt with them quite clearly. He speaks of constant sniffing, hawking and spitting. Noisy puffing and hissing or snorting through the nose or mouth, paroxysmal or phasic.

¹ Bignami, A. Sui rapporti tra la corea elettrica di Dubini e la encefalite letargica. Riv. Osped. X, 1923, 527.

² Zingerle, H. Beitrag zur Kenntnis des extrapyramidalen Symptomen complex. Jll. f. Psychol. u. Neur., 27, p. 166.



FIGS. 11a and 11b. Tracing taken from Case 4 recording simultaneously myoclonic movements of the left trapezius and respiration. Note the rapid rate of breathing, and also the synchrony between the myoclonus and the respiration (Turner and Critchley).

Serial yawning or sighing, sighing and hiccoughing. Wimmer's case 12 (p. 72) had as already noted pronounced yawning attacks antecedent to a tachypnea. She had jerky fits as many as 20 a day—

later 135—and her tachynea would rise to 70 noisy respirations to the minute. This case is further of interest in that it was preceded by hiccupping attacks a year previously.

Isolated yawning attacks have also been recorded by many observers. Our case II is a classical example (see Figs.) also Turner and Critchley's case 2 (see p. 607, J. N. & M. D., July) and cases by Abrahamson, Buzzard, Howell, Pardee, Mayer and Saussure, Sicard and Paraf, Wimmer and others.

Whooping cough like attacks were studied by Marie and Lévy and others and are noted as introductory to later respiratory difficulties by many authors—see case I of Turner and Critchley.

It is often stated that these tics may occur as isolated but closer study nearly always reveals other respiratory situations. Many observers fail to mention any of these tics. As Turner and Critchley note possibly they were not looked for.

Bilancioni and Fumarola, Lévy and many others refer to the "hysterical" "pithiatic" hysteriform (Wimmer) nature of these phenomena and Lévy devotes some pages arguing as to their "organic" nature. Most authors seem steeped in the parallelistic or dualistic doctrines of old time neurology. Inasmuch as this type of presentation does not appeal to us, since here the psyche is deemed as old as the soma and one, the discussion of the pathogeny problem involved is here touched upon to be discussed more in detail later.

PATHOGENESIS OF THE RESPIRATORY SYNDROMES

In view of the great diversity of the phenomena already envisaged as respiratory it is illusory to hope for any monistic interpretation as to pathogeny. This situation has been emphasized for the larger encephalitic syndrome. It is equally true that even the respiratory phenomena are complex, in spite of the limitation of the field of observation. The statement of Turner and Critchley that "at the present time the discussion as to the causation of the postencephalitic respiratory disorders becomes purely speculative" can be better expressed by saying that, certain of the phenomena can definitely be run down to definite lesions—notably the Cheyne-Stokes breathing, so often seen in acute situations and persisting at times partly modified into the later stages—whereas at an opposite pole definite psychogenic factors can be seen to be operative as the results of diaschitic splitting or dissolution of function due to partial involvement of higher cortical reflex pathways. Until more is known of cortical pathoclasia the structural correlates here will remain unknown. Patho-

genic interpretative formulae for intermediary situations, possibly seen statistically as preponderating, remain as Turner and Critchley well state, undetermined, by reason of a multiplicity of factors, hence speculative.

A historical review of the general situation brings out the complications surrounding any monistic interpretation. Turner and Critchley summarize these as follows:

(1) *Peripheral origin hypotheses.* Bériel, Hardoin, Vincent and Bernard, Laignel-Lavastine (diaphragmatic dissociation), and others.

(2) *Bulbar localizations.* Definitely shown in severe involvements, Goldflam et al—for specific types—Cheyne-Stokes, etc., and assumed for attenuated forms Roch, Rosenow and others.

(3) *Various thalamic hypotheses.* Here the afferent stimulus is thought to be blocked and thus the phenomena are brought in line with the thalamic sleep hypotheses. (Jelliffe et al. for sleep.) Pardee as a suggestion merely for the respiratory phenomena described by him.

(4) Turner and Critchley advance the situation a bit and include *higher psychomotor tract involvements* which will be here discussed as relevant to the general dissolution of function aspects since respiratory function as such is known to have voluntary cortical regulatory mechanisms.

(5) Furthermore the larger mechanism of respiratory expression—*emoting* functions, which are of so much importance in the higher psychical activities of speech behavior should be included—and

(6) Still further attention should be directed to those coördinating pathways which sweep up visceral components into the thalamus, striatum and cortex for the body as a whole in its emotive synthesis.

Diaschisis here while as yet unanalyzable to our complete satisfaction may be reached for when the entire respiratory syndrome is reviewed as an aggregate.*

(7) Finally it seems not inopportune at this juncture to bring into the discussion certain metapsychological points of view which the conceptions of the Super Ego, the Ego, and the It as formulated by Freud and the psychoanalytic school in their studies of the trau-

* Weinberg, A. A. Psyche u. unwill körliches System. Zeit. f. d. g. N. u. P. 85, 86, p. 93.

Küppers, E. Ueber den Ursprung und die Bahnen der Willensimpulse. Zeit. f. d. N. P. 86, 1893, p. 274.

Goldstein, K. Zur Theorie der Funktion d. Nervensystems. Arch. f. Psych. 74, 1925, 370. Ueber den Einfluss motorischer Störungen auf die Psyche. D. Z. 85, 1924, 119.

matic neuroses, the conversion phenomena, substitution phenomena, organic psychoses and organic disease itself.

It is probable that in this or that individual that one or all of these factors can be placed into relief and contribute some light to this highly complex series of phenomena.

It is a commonplace in the casuistic material to find organic involvements of liver, intestines, skin, kidneys, appendix, pancreas (diabetes), hypophysis (obesity), etc. These visceral implications must have their reverberations in the central organs of the Ego, metapsychologically considered, just as in a gross metaphorical sense, the captain of a ship knows where something is wrong with his machinery or his crew working the same. Psychotic splitting is so frequent as to raise the issue, why? and what is its function? Repetition compulsive phenomena (stereotypes, palilalia, etc., etc.) are equally prominent. The entire literature is shot through with the lazy and inadequate summary of "hysteria," *i.e.*, conversion phenomena, as viewed psychoanalytically, and the hospitals are filled with patients whose behavior resembles that of the picture of the traumatic neuroses, in some of which the respiratory phenomena, particularly at certain periods, show the characteristic anxiety neurosis phenomena of the Freudian formulations.*

Whereas it is recognized that this "classificatory" partitioning of the material is but a logical artefact yet the scientific method as such is reduced to the utilization of such fictions in order that analysis and synthesis can be brought about for pragmatic purposes in the handling of individual cases. I need not unnecessarily dwell upon this old Protagorean-Socratic series of antitheses between particulars and universals which has been the battling ground of the philosophers from time immemorial.¹

(1) *Peripheral (Muscular) Origin Hypotheses* (Fictions).

These are not "theories" as others have termed them. It is doubtful, following Vaihinger, whether they have even the validity of hypotheses, but it will serve little purpose at this place to split logical hairs of scientific method.

As already indicated Bériel and his pupil Hardoin, in his thesis

* Bychowski, G. Psychopathologische Untersuchungen über die Folgezustände nach der Encephalitis epidemica, insbesondere den Parkinsonismus. Zeit. N. P. 83, 1923, 201. Ib. Metaphysik und Schizophrenie. Abhand. N. P., No. 21 Karger, Berlin, 1923.

¹ Compare: Lange—History of Materialism, and Lewes—History of Philosophy. Chapters upon the Atomists, Sophists, Socratics, and Platonists.

elaborated the notion that the tachypnea was a compensatory phenomenon to make up for the micropnea which was conditioned by a striatal rigidity affecting the intercostal muscles. As Turner and Critchley correctly observe this cannot be true for all the cases since in a number no such parkinsonian rigidity exists in the muscles.

Our own observations—in addition the two cases here reported as paradigmata—tend to show that the Bériel-Hardoin observations have considerable validity. Most of the cases seen by us have had a certain grade of this “rigidity”—*i.e.* static tonus, but it is here regarded that this increased breathing is not a reflex phenomenon solely conditioned by the hypertonus, but rather the view is held that *both* the breathing *and* the tonus have a more unitary conditioning. Thus the hypothesis is not a peripheral one but is more complicated and thalamic and striatal pathogeny are involved. What this may be will be discussed under the general heading of an ego defense mechanism (postural attitude) which takes into consideration a number of inimical organic offenses, from other organs than the respiratory ones alone.¹

Turner and Critchley include here the diaphragmatic myoclonic movements—really referable to the “tic” types. These myoclonic situations—epidemic hiccough, Dubini’s electric diaphragmic choreas, etc., while manifestly of muscular origin do not properly belong here. Gamble, Pepper and Muller’s phrenic freezing experiment seems to show that the synapse of this nerve is involved in the reflex chain in these myoclonic diaphragmatic tics.

(2) *Thalamic Hypotheses.*

Our own observations tend to show that thalamic involvements are very frequent and register themselves early in the lethargic features of the general encephalitic syndromy. (Certain pharmacological agents, particularly of the alcoholic series—chloral, veronal, trional, medinal, have induced deep sleep and a marked cessation of the respiratory disturbances. Just what deductions are to be drawn from these still remain for further study, especially in view of what Schilder writes in his *Lehrbuch der Hypnose* about medinal poisoning experiments and changes in the central grey of the III ventricle which has vegetative functions, maybe re sleep as v. Economs hypotheticates.) Direct associations between the respiratory situations and the thalamic implications are undoubtedly present in many cases. Careful con-

¹ This statement would lean heavily upon Wilson’s clear outline of the difficulties in his “The Old Motor System and the New.” *Arch. Neur. & Psych.*, 11, 1924, 385, in which the problems are clearly envisaged as to their complexity, not to mention a host of related studies—Ramsey Hunt, Lewy, Jacob, Vogt, Magnus, et al.

sideration of the Dejerine-Roussy, Head-Holmes, studies upon thalamic-cortical interrelationships relative to the handling of the afferent impulses from implicated extero and interoceptors leaves a number of thorny problems to be more carefully studied.

It seems still open whether the thalamic hypothesis is a main situation as now conceived. It must be left for a special study of how these patients handle the specific incitors of their attacks. Thus in case I certain suggestions have been advanced relative to specific incitor factors as operating to induce or to control the discharge which has been narrowed down to the respiratory apparatus—operating at low ontogenetic levels.¹

When it is firmly held in mind that all movement, whether automatic or voluntary, implies response to stimuli, external or internal, either conscious or unconscious, the possibilities of handling by the thalamus or by that of its sensory homologues at the same level are not too easily dismissed. As one reads the earlier studies of Gerstmann and Schilder, then those of Förster, of Böstroem, Wartenburg, Cruchet, Wilson, Gampers and Untersteiner and many others, it has become more and more evident that certain definite behavioristic patterns appear either in pure culture, as it were, or mixed with other patterns. At times these patterns have been isolated—Wartenburg's studies upon athetosis and upon torticollis may be cited among others—while particularly noteworthy are the observations of Gerstmann and Schilder and their confreres, the study of Böstroem and the most neatly analyzed case by Gampers and Untersteiner.¹ Here was a complex group of movements which, briefly indicated, started with a mouth opening, turning of the head towards one side and a series of compensatory torsions to meet the original mouth stimulus. The authors analyze it on the basis of a yawning reaction and then pursue it further as a reflex response to an oral stimulus such as occurs in nursing. They show that the whole movement is but an extensive spreading from this original sucking stimulus. They offer no introspective material upon this point, as is believed necessary from the viewpoint maintained here, but the purely behavioristic analysis is so strongly confirmatory of the point of view here advocated—*i.e.* the dissolution of function to earlier levels of behavior.

Here it is evident that the initial sensation starting in the mouth undoubtedly reaches the thalamus, and from here on—as with the Head and Holmes series, an exaggerated and diaschitic response is

¹ Consult v. Economo's very suggestive study, *Ueber den Schlaf*. Springer, 1925.

¹ Gampers and Untersteiner, *Arch. f. Psych.*, 71, 1924, 292.

released in the form of an isolated pattern. It seems highly probable then that careful histopathological scrutiny of the thalamus and its homologues will be fruitful. This has already begun but cannot be discussed further here since it is all too general.

Tilney and Casamajor¹ have attempted the analysis of the isolation of these bits of patterned muscular response (automatic associated control) in lower animals by the myelogenetic method and their work is here conceived of as of great importance in the field now under revision.

(3) *Medullary-Bulbar-Hypothetical Origins.*

It is not at all surprising in view of the many cases of respiratory death with definite lesions microscopically observable (Goldflam et al.) that most observers have looked upon the respiratory difficulties in the postencephalitic as attenuated types of such medullary-bulbar implication. Here two conflicting series of observations stand out. In the one the respiratory difficulties have been developed directly out of or were continuations of the early stages of the respiratory phenomena. Should one reread the many observations here recorded it will be seen these were in the minority. On the other hand the post-encephalitic respiratory difficulties have supervened many months after the initial difficulties. In many, it is true, that the interregnum has shown many sniffing, hawking, coughing, "bridges," yet the purer types of tachypnea, regular or irregular have seemed to become consolidated often many months after the original difficulty. It is of interest to note that Wimmer in his very masterly study follows v. Economo and others and has repeatedly called attention to reinfection or persistence of subinfection to account for the advance in the symptomatology of these post-encephalitic cases. While we believe there is no definite proof to show that this is not so and possibly none in its positive favor, the point of view here outlined is that this conception must be set alongside of or possibly in opposition to the view that *regression of function* through focal disease elsewhere is of significance, and furthermore the whole problem of dynamics is opened up. We mean by this that minimal focal disorder may raise a threshold so that the energy flow, by regression, psychologically considered, may take other pathways for its discharge. In a sense analogous to the use of a single switch line when others are blocked. Disintegration of function through relative disuse is seen everywhere in human pathology and it will be one of the features of this review to accent this well known principle especially as it calls

¹Archives of Neurology & Psychiatry. 1925.

for a larger therapeutic ingenuity than the more or less fatalistic attitude of "progression of a disease process through reinfection."

Personal observations have shown repeatedly very marked functional regression in the respiratory syndrome especially during some intercurrent disturbance. Thus case II is markedly worse during a menstrual epoch and also during a tonsillitis. Note has been made of the breaking out of the respiratory syndrome following a tonsillectomy in case I, and I have gathered a number of observations showing marked regressive behavior disturbances of the schizoid type in postencephalitics also following tonsillectomy. Hardly can it be argued seriously that a tonsillectomy can constitute an advance of the infection or a reinfection but it can be legitimately considered as a factor making for regression.

To cite but two bits of evidence from many bearing upon the increased susceptibility of these patients. One study of Appelroth is of interest.¹ This investigator has shown a marked increase of stimulus reaction on the part of the skin of the postencephalitic to X-rays, while an interesting study by Beringer² demonstrates that muscular strain may bring about a distinct advance in the postencephalitic syndrome. These lines cannot be followed further here although they merit specific consideration.

¹ Appelroth, *Strahlentherapie*, 18, 1924, 593.

² Beringer, *Klin. Woch.*, 3, 1924, 2058.

(To be continued)

SOCIETY PROCEEDINGS

NEW YORK NEUROLOGICAL SOCIETY

THE FOUR HUNDRED AND TWENTY-NINTH REGULAR MEETING,
MAY 4, 1926. THE PRESIDENT, DR. I. ABRAHAMSON, PRESIDING

DISCUSSION OF TWO BOOKS ON RECENT ANATOMICAL INVESTIGATIONS

SMITH ELY JELLIFFE, M.D.

FOIX and NICOLESCO: *Anatomie Cerebrale. Les Noyaux Gris Centraux et la Région Mésencéphale Sousoptique suivi d'un Appendice sur la Maladie de Parkinson.* Masson et Cie, Paris, 1925.

VON ECONOMO, CONSTANTIN FREIHERR, and KOSKINAS, GEORG N.: *Die Cytoarchitektonik der Hirnrinde des erwachsenen Menschen.* (With an atlas of 112 microphotographic plates.) Berlin and Vienna, Julius Springer, 1925.

Dr. Smith Ely Jelliffe said that in view of the fact that certain recent publications had come to his desk as a reviewer he felt their importance merited a few words from him. It was not his intention to enter into any lengthy discussion. The works would speak for themselves, but he felt assured that the members would welcome having their attention called to them, hence his modest words of introduction.

Since Dejerine and Mme. Dejerine had made their noteworthy contribution to the Anatomy of the Nervous System, no great French classic had even vied with it in its unrivaled brilliancy. In fact, it was doubtful if any work anywhere combined as did this great masterpiece that most inimitable of qualities of the French mind, clarity and terseness, with an equal profundity and thoroughness contributed by Mme. Dejerine Klumpke, a daughter of an illustrious family with whom we could claim some kinship as she was of Californian birth of German origin.

It was a pleasure therefore to call attention to this new work of Drs. Foix and Nicolesco, conceived in the same sincere manner and executed with an exemplary thoroughness. It deals with the basal ganglia, the hypothalamic nuclei, the nuclei of the tuber cinerea, and mesencephalic structures, generally. They first deal with the general topographic relationships; then take up in detail by serial sections in all three planes the myeloarchitectonic as well as the cellular constitution. Each nuclear mass in this complicated region is exhaustively studied and beautifully illustrated.

Finally the authors add a chapter upon the pathology of paralysis agitans.

The whole is a beautiful piece of bookmaking as well, and Masson et Cie have outdone themselves in this most creditable piece of work.

The second book is really a great event. Its appearance marks a milestone in the study of the cerebral cortex. One recalls the early efforts of Bevan Lewis and then the atlas of Bolton, and then that of Campbell. Finally the splendid study of Brodmann came, instigated chiefly by the Vogts and furthered by Brodmann's many admirers. What he might have done at Kraepelin's new institute had not the war and death cut short his career no one knows.

And now comes the monumental work of Von Economo and Koskinas. A cursory glance at this work discloses it to be dedicated to the "problem of problems." Somebody finally has attempted to chart the human brain, rather than drop flags upon the floating ice of the North Pole.

From Meynert and Betz and Bevan Lewis down the principles have been steadily preserved. Upon these foundations the labor has been an unceasing one toward an exhaustive analysis of the objective structures present. Whatever may be the changes and reactions of scientific and philosophic opinion this tradition has afforded an unqualified fund of facts upon which opinions concerning the composition of human characters must be based. The authors have manifestly embedded their work in that tradition and have built, for cytoarchitectonics, a keystone of exactness and completeness. The cardinal test of this work, as of any other scientific effort, will be found in the extent to which it matches up with the manifest characteristics of man and with the positive results of other carefully directed researches.

One catches at once the spirit of objectivity in its most striking modernity. The 800 page text is divided into a general and a special part, the latter section describing and analyzing in systematic and comprehensive detail a separate atlas of 112 immense photographic plates. We can hardly be more truthful than a photograph, especially when we do not retouch as the authors assure us they have not done. The atlas is not only the most important part of the work, but it is an innovation born of foresight and a desire for perfection. After carefully approaching the facts according to the method minutely detailed in a special chapter, they were photographed in 50x enlargement. These were then doubled to 100x magnification of the plates and the enlarged but unadulterated truth was plain for anyone to see and to compare. The result is that a section of the cortex normally about 3 mm. square appears upon a faultlessly clear plate about a foot square. Each plate is further bounded on three sides by millimeter scales included in the photograph (in order that any distortion of the truth by fixation methods might equally distort the rule of judgment); so that, by a simple calculation, one easily arrives at the normal size of any distance on the plate, the spatial relations of the particular slide in the brain,

or the actual number of cells *de norma*. The atlas is not less than a norm of the cellular and areal anatomy of the brain.

The text matches the atlas in a continuation of its thoroughgoing objectivity and particularly in its leisurely comprehensiveness. Following a historical and systematic introduction in which the authors, ever consistent, refreshingly return credit to those who deserve it, there are exhaustive chapters on the morphology and relation of the cells, the development of the forms of cortical tissue to be discussed, and the anatomy of the various layers of the cortex with a view to their differentiation. In regard to the number of layers of the cortex and the question of the morphological types, the authors compare their own studies and plates with tradition and find that they can serve both without deviating from their goal. Since the days of Bevan Lewis we have accepted the six layered cortex and the atlas magnifies the verification beyond doubt. The subdivisions of each layer are here continued as such. The morphological division of the cortex as a whole into two types has its origin in Brodmann's comparative studies. The authors accept Vogt's terminology for these types but adduce a complete series of their own sections and several plates to illustrate the validity of the iso- and the allo-cortex. The results of myeloarchitectonics are drawn upon for further corroboration and also the comparative studies of Chr. Jacob which led the latter even beyond this goal. The iso-cortex is the normally six layered mantle whose greater or lesser variations from the type are hetero- or homo-typical. This type of cortical formation is found in the prepondering mass of the brain surface with the exception of the primary olfactory brain and the parts derived from it. These latter possess a cortical formation of another order and constitute the allo-cortex. When Jacob goes on to divide the iso-cortex further into an outer and an inner layer, the former sensory cortex, the latter motor, the authors agree to the ingenuity of the conception—and leave the decision to future corroboration. They themselves adduce evidence to show, however, that the allo-cortex is laid down in the third month about three months prior to the iso-cortex and permit themselves the opinion that the same concurs with the rudimentary and primitive differentiations of the allo-cortex.

In continuation of the tradition of areal differentiation, the authors have raised the number to 76 more or less definite fields, and 107 when the major modifications are included. Brodmann had raised Campbell's 29 to about 50, but the authors expect to see their own number increased and verified by an even greater intensification of the microscopic method. There is no reason why this should not be the case given these premises and the method, and those specialists who deplore the search for the last cortical area have apparently failed to draw the full consequences of their scientific position. On this point the atlas speaks clearly enough and the text offers several schematic maps.

These areas are, however, specific only in respect to their immediate vicinity. In the iso-cortex they generally disclose one or another

of five types of layer formation and it is the distinguishing contribution of this work to have introduced this morphological basis. The broad banded, agranular type of cortex possesses large pyramidal cells (apart from the Betz giant cells), and a well developed sixth layer, but very few granular cells, and is found parietally and on the median wall. This type often forms a combination with type 1, as in the whole second and third temporal lobes, the operculum, and the gyrus postcentralis. The third, or parietal type, discloses an even greater development of the granular cells. At the very frontal pole as well as occipitally is the polar type of cortex, thin banded and filled with small cells. The occipital as well as the medial lining of the calcarina and a stripe along the inner wall of the hippocampus possess the completely granular or koniocortex, the archetype of sensory cortex denoted by Meynert. The relation of the areas to these five basic types of lamellated iso-cortex is then in the nature of a metamorphosis from one type into another or within a type, changes sometimes slight and at other times more abrupt. The distinction of these areas has always been a matter of much individual appreciation, and one could reasonably expect to catch impersonal research in a bad corner. True, we are not enlightened by a mathematical system whereby to get around this difficulty. The authors are fully aware of this personal moment, but they define with exemplary accuracy the microscopic elements by which alone they arrive at such distinctions.

In the wealth of detail massed in the special section there is still evidence of an orderly review of the material. For each separate area there is a regular plan of paragraphic analysis and it is especially in the paragraphs on the physiologic importance of the areas described that the authors display an enviable regard for the difference between fact and fiction. They are at thankful pains also to circumscribe the limits of any sort of objective research in regard to the cortex, reflecting a thorough acquaintance with the psychologic point of view in neuropsychiatry. The inaccurate use of the word "specific" in regard to cells as, for example, "specific visual cells" is shown to be misleading and valuable only in so far as the cells are considered to be of a specific morphologic type. The specificity of vision is as yet beyond the microscope. The question of localization in respect to the major sections of the cortex is delicately handled in view of the insecurity of that topic since the work in encephalitis and the aphasiae. Von Economo's own previous studies have done not a little to disclose the importance of the sub-cortex in cortical physiology and he further concurs in the conclusions of modern psychiatry that many functions are hardly to be localized at all except in the organism as a unit. Wherever the clinical and pathological data are well enough arranged, however, the authors do not hesitate to bring them into relation with the anatomy of the areas in question.

At every point the work has lived up to its tradition and its premises and is in every way a *Realencyclopedia* on the study of the cortex. The authors are at pains to advise methods and have

forestalled errors in technic and measurement. Wherever their researches lack the backing of experimental study they are quick to report the necessity of it and suggest at length not a few paths which must lead to a correlation between several methods of research and their own. The format of the work is in just proportion to the dignity of the object and wherever research is being done on the brain it will be a steady guide.

TUMOR IN ANTRUM OF HIGHMORE—PNEUMOCOCCUS MENINGITIS

DR. MAX LEDERER (By Invitation)

(Author's Abstract)

E. W., fifty-two, housewife, was admitted to the service of Dr. Blatteis of the Jewish Hospital, Brooklyn, March 7, 1926. For 15 years she has been under treatment for right-sided trigeminal neuralgia and headache; with blood pressure subnormal; varicose veins and ulcers; and always subject to frequent colds. For three weeks, suffering with an upper respiratory infection. Has been married for 33 years; has four children and had two miscarriages; has never had any symptoms of diabetes nor sugar in urine at any time.

Present history: She was found in a stuporous state sitting on the floor near her bed. She was unable to talk, but apparently suffered from some discomfort or pain in the chest. While being lifted into bed she vomited what appeared to be blood-tinged material. An ambulance was called and she was taken to the hospital at once.

Physical examination on admission discloses a heavily built female, in coma, with hyperpnoea, cyanosis, and injection of the capillaries of the face. There is an acetone odor of the breath; her eyelids are slightly edematous; pupils react to light and accommodation; ears and nose are negative; tongue is dry and coated; teeth are in fair condition. The abdominal reflexes are absent; knee jerk (right) is more active than left; the neck is rigid; there are no other neurological symptoms. Temperature, 101°; pulse 80; respiration 15. Urine contained 2.5 per cent sugar. Many red blood cells, acetone and diacetic acid. Blood count showed 20,000 leucocytes with 86 per cent polynuclear neutrophils. Blood contained 272 mg. of sugar per 100 c.c.; the carbon dioxide combining power was 40 volumes per cent. Following insulin and glucose intravenously, the glycosuria disappeared for 24 hours and the acetone bodies were greatly reduced in quantity. On the following day lumbar puncture yielded a purulent fluid under increased pressure containing 7,460 cells per cm., of which 79 per cent were polynuclears, and a pneumococcus. The blood culture was sterile. Her temperature rose, and on the third day she relapsed into the hyperglycemic state, with a blood sugar of 172 mg. per 100 c.c. and marked glycosuria, and developed a left-lower facial with a right-sided hemiplegia. Brud-

jinski, Babinski, Oppenheim and Gordon signs also appeared on both sides. She died in coma three days after admission.

Post mortem examination was limited to the head. The dura was normal. A milky exudate was distributed along the course of the veins, especially those of the Sylvian fissure. In the ventral surface of the pons was a small hemorrhage 0.5 cm. in diameter. Attached to the dura on the right side was a tumor 6 x 5 cm., which extended to the sphenoidal fissure and had eroded the lateral wall of the body of the sphenoid, the lesser wing of the sphenoid and the anterior third of the petrous portion of the temporal bone. It projected into the maxillary antrum. On opening the ethmoidal cells, a large amount of yellow pus escaped. The pituitary is about two and a half times its normal size—red, soft and boggy. Microscopically, part of the posterior lobe is the seat of an abscess, which encroaches on the infundibulum. Examination of the tumor reveals the typical structure of endothelioma.

The points of interest in this case are: (1) The possible association of the slow growing endothelioma of the dura and the trigeminal neuralgia. (2) The hyperglycemia and glycosuria apparently consequent to an abscess of the posterior lobe of the hypophysis. (3) The unusual portal of entry of the pneumococcus, via the ethmoidal sinus, due to erosion of the lateral wall of the right nares by the tumor.

Discussion: DR. IRVING SANDS said: The hemiplegia was accounted for of course by the hemorrhage on the lateral surface of the pons. The patient was unconscious and we could not elicit any 8th or 9th nerve symptoms. One could see definite flattening of the left side of the face in the lower two-thirds, and a right-sided hemiplegia. At the autopsy I could not get the Gasserian ganglion. There was no ganglion whatever. The anterior third of the petrous portion was missing. The pus exuding from the ethmoid cells was unquestionably the cause of the pneumococcus meningitis. She received as much as 200 units of insulin without any change of the blood sugar content. We feel that the injury to her pituitary must in some way be connected with her glycosuria. She had never been treated for diabetes.

A PSYCHOLOGICAL STUDY OF THE NATURE OF THE IDIOT

DR. L. PIERCE CLARK

(*Author's Abstract*)

The study is based upon the use of the term idiocy in its generic sense, to embrace the total gross defect of mental arrest. In viewing the physiological and pathological aspects of idiocy we are forced to consider an explanation of the defect not upon the basis of a lesion, although a defect in the development of actual physical structures of the brain may itself entail an irritative or destructive

action upon the remaining unimpaired structures thus bringing about a hampering of the development of the brain as a whole. The main defect in idiocy lies in the functioning of the brain as the main ego organ of the total personality, and the idiot, looked at from the psychoanalytic standpoint, is a completely narcissistic individual bound and hampered by the very nature of the impounding of the libido within the defective functioning of the brain as a determining organ of control over the proper functioning of the total personality. It may be considered as a form of cerebral pathoneurosis at the infantile level. The life activities of the idiot are none other than archaic patterns of infantile behaviors of a chronic and long enduring pathoneurosis—enormously spread out, but so stunted that they reach a developmental stature of hardly more than two years of age. Can his limited intelligence be reached for analysis and help? Itard was the first to train an idiot, and he accomplished a great deal in opening up the mind of his savage by physiologic methods and a natural application of humanistic principles. Seguin followed Itard, but the treatment of the idiot has become static on Seguin's principles owing to the assumption of a purely mechanical or physiologic approach; and further progress has been retarded due to the failure to take into account the teachings of modern psychology that the libido is circumscribed in its functioning of the total defect in development of the ego, thus producing a condition of narcissism which because of the very nature of its defect entails the greater defect in the further functioning of the idiot as a human being. His elaborated system of living is as complicated as ours but is totally nonadaptive to our pattern of existence. Thus the paradigm holds true that the idiot becomes more idiotic as a reaction to his idiocy.

A case is given of a boy 12 years old. When first seen at three years of age he was a low-grade idiot, impossible of control or direction. His mental state was apparently secondary to a meningitis which in turn was secondary to a double inhalation pneumonia from a severe chronic colitis at 18 months of age. The boy was essentially normally endowed at birth. At five years of age when he was placed under my care he could not express a want, depending on others to provide for him. The usual sense training improved his ability to express his wants and care for himself to some degree, but he continued many idiotic nonpurposive actions and was petulant, unhappy, full of tantrums and generally difficult to deal with. Four months ago analytic treatment through the use of the play instinct was instituted. The treatment was so carried on that the boy was given the position of leadership. The analyst at first imitated his activity and his responses, and made no suggestions. This sense of leadership gave the boy much pleasure. In four months his behavior has altered to a considerable degree. His tantrums seldom occur; he can accept direction without his characteristic burst of petulance; his idiotic mannerisms are diminishing and his physical restlessness has greatly decreased. His ability to express himself lags far behind his comprehension. He has now shown himself able to continue at an activity for twenty minutes at a time, whereas his power to con-

concentrate even for short periods was poor. When the boy meets difficulties, as in dressing, he pretends pain, or makes strange noises, and begins to show signs of a tantrum. The analyst makes the same noises and motions and pretends the same pain. The boy laughs and his rebellious attitude passes away when he sees he is being imitated and he continues to struggle with the task at hand. His increase in happiness and repose is marked.

The usual method of attacking the senses directly merely increases the difficulty of life's demand and forces the further retreat from stress of the handicapped personality which lacks all motive, mental and emotional, for the idiot's further use of the senses in self gratification. If, by following the idiot's own simple ways of gratifying his emotional needs we can increase those needs, we enlarge his personality and put him in the position to desire further sensory and emotional satisfactions. This is growth, for normal as well as arrested mentalities, so that the success of the analytic technic should be of interest to all teachers and social workers as well as those directly concerned with the care of the feeble-minded.

Idiocy and all states of mental arrest are probably subject to mental analysis as well as psychoanalysis. These states are in the terms of dynamic psychology egoneuroses of narcissistic origin or pathoneuroses of intrauterine life or earliest infancy. The cerebral lesion or lesions wound the ego organ (the brain) and in consequence the narcissistic libido is imprisoned in these damaged structures, thus preventing free circulation and upbuilding of the psyche. The clinical picture is one of an almost pure form of ego pathoneurosis of infancy consequent to this damming-up process. Fortunately in the majority of such cases there is some libido not entirely engulfed within the ego; this, however, is largely of the narcissistic type and to be made useful in restraining and development. We must first give libido to these little charges instead of extracting it by disciplines and commands. Once freed in part by more libido formation, in play and personal living advantages, the same may once more be gradually placed toward ego development and finally to objective interests and love so that later socialization may be brought about as in normal children. The fault heretofore has been in placing too much stress upon mechanical (physiologic) principles and not upon the libido as the emotional leverage by which the intellect as such may be quickened and made alive. In part this stress laid upon the importance of the emotions is not new, in that Itard and many a faithful worker in the educational field for this feeble-minded class have operated practically with the same general results that we desire to bring about. The main contention is, however, that the accent on using the emotions is not on that point alone but in addition should be brought into play in the light of Freud's work in dynamic psychology and as such to be employed by those skilled in psychoanalytic technique and its practice. Finally, not the least advantage of our preliminary study is the influence of reawakened attention, which this manner of approach may have in all teaching for many so-called normal children only a little retarded in mental development in which the ego develop-

ment is perverted or not properly sublimated into objective interests of normal living.

No matter how innately efficient the tutors for these idiot children may be, it is essential that they have a preliminary training in psychoanalysis and especially in the analysis of the narcissistic neuroses. The analytically trained psychiatrist should supervise and direct the work. We have laid too little stress upon this latter fact. Relatively recent psychiatric thought is still largely in the service of the fixed patterns of current social custom, to which the idiot as well as the psychotic has been forced to conform. This is mainly the province of many mental hygiene and social service agencies. To reach the deep-rooted narcissistic states of idiocy and psychotics one needs to take a more subjective attitude and avoid identifications with any set of social customs just as specifically as in ordinary analysis the analyst rids himself of censorious attitudes toward sexuality commonly adopted by society. In other words, the analysts must hold themselves free from critical judgment in the realm of current static social behavior. When this latter principle is attained by self analysis impartial analysis will make results in this comparatively new field of dynamic psychology as progressive as has already been attained in the transference neuroses. It is largely due to the nonacceptance of this latter principle that we have been blocked from brilliant results in this group of narcissistic neuroses. The difficulty of operating upon these cases by the narcissistic transference will always encourage the analytic psychiatrist to employ the object libido as soon as it may be awakened and is strong enough to bear the continued leverage necessary to carry the work to a so-called normal fruition. Until the latter is possible the narcissistic transference must necessarily be employed.

Discussion: DR. H. W. POTTER (by invitation) said: I am very glad to hear this paper of Dr. Clark's because it is a very valuable sidelight in my work with mental defectives in a large state institution and also, from my experience, I think I have a few sidelights which might be interesting in relation to many of the things which Dr. Clark has brought out. The first thing is the use of the term "idiocy." Of course there are all kinds of idiots, almost as you might say there are all kinds of normal individuals, and I am under the impression that Dr. Clark was speaking particularly in his paper of idiots of secondary origin, that is, due to meningitis or some other cerebral accident. Whatever the etiology is of these cases, we see this type of narcissistic behavior in many idiots and also we do not see it in many others; and that brings up the question of just what the relation of this behavior is to the idiocy or what the relation of the idiocy is to this narcissistic behavior. If you go through the dormitories where there is a large group of idiots you will see a certain number of them who are practically identical with cases of dementia precox that we see in the back wards of the state hospitals. One begins to wonder if there be such a thing as *infantile* dementia precox, because this reaction is so remarkably comparable to that of certain deteriorated types

of dementia precox; so that it even brings up the question of what relation the narcissistic fixation does have to the development of intelligence.

I would not be surprised if quite a few persons were thinking that all that Dr. Clark has said may be very nice and very interesting, but how are we ever going to use it practically?—how can it be done? I would like to say that it can be done, and it is being done at the present time in many of the institutions, and it is being carried on on a very large scale in the institution I came from. It is being done in not an individualistic manner as Dr. Clark's method, but it is being done very effectively.

We have a very large class, with over 250 patients in it, with three or four periods scattered over the day. The woman in charge of the class is the only woman who can carry the class on. She started about eighteen months ago on a very small scale, taking a small group, four or five to begin with, and getting them to do some of the most simple things, the things which are obviously of considerable use, and things in which the patients take almost immediately a definite interest. In other words, as Dr. Clark would say, she coaxes out the libido of these patients onto their environment. It seems that there are certain of the higher grade defective girls that can be picked out that can assist the instructor in carrying on this work with idiots and low grade imbeciles. This has been of decided benefit to the patients and to the general management of the dormitories in which they live. The patients have changed from untidy, practically vegetative organisms, to children that are more or less alert to their environment, and they are able to keep themselves clean and care materially for themselves. In the second place, the things which these children make are of practical use to the institution. An interesting thing is that as far as the test in intelligence is concerned, they have not gained anything at all. In other words, a child with an I.Q. of 25, when it started in the class, despite the fact of his tremendous social and emotional improvement, will remain at the same intelligence level. But that is neither here nor there, because they are much better individuals socially, and the institution is much better for their having done this work.

DR. PHILIP R. LEHRMAN said: My experience with idiots is very limited, except for the occasional emulation of them. Facetiously, we may say that heretofore we have been trying to think idiotically, but Dr. Clark stresses the fact that we should also try to feel idiotically, and perhaps in that way we can get a better understanding of them. Certainly it would seem that the approach he is attempting would be encouraging from this standpoint. What he is trying to do is to apply his psychoanalytic insight to a very fundamental factor, the lack of which causes the idiot to react more idiotically. The idiot usually lacks the object libido side of his development. In that particular he is entirely different from the schizophrenic and the encephalitic who have had object libido in their development, but due to their disease process have lost it. In dementia precox what we are attempting to do is to rescue some part of the object libido

that has been lost and bring it forward. In the idiot Dr. Clark wants to add something, and this addition Dr. Clark thinks can be utilized for the better socialization of the idiot. It would seem to me that the approach itself is an extremely courageous one. We certainly ought to encourage it. It is an approach that might help the idiot, that might help the institution problem, and might help the teacher in handling the problem much better than he has been able to handle it before.

DR. SMITH ELY JELLIFFE, said: Dr. Clark is an incurable idealist. Seen from the viewpoint of the Einsteinian gravitational frame, we belong in the same class. I have been called an idealist as much as he, and therefore I am in accord with most of the points of view expressed, and sympathetic to them. I can quite understand why Dr. Clark should go into this situation, surrounded as he had been from his earliest years in his psychiatric work by extremely difficult problems. They have not been easy to solve, and I think I can say that he has not been content just to get his meal-ticket; he wants to earn it, and therefore he has dug deeper and deeper and still deeper into these most difficult problems with the idea of some effort at solution. I do not think that he is a blind optimist by any manner of means. He has already nicely said that he is not expecting to rejuvenate a whole class of individuals that he has very roughly delineated as idiots and at any rate, the point of view is certainly worthy a great deal of consideration.

I have just been trying to struggle through a recent book called "The Meaning of Meanings,"¹ and in reading it have been more and more convinced of the validity of that cynic's definition of what a "normal" person was. He said that a "normal" person is an idiot who is able to conceal his idiocy. In an appendix to this interesting book Malinowski, reader in ethnology in Cambridge, gives some very interesting illustrations. He says: "Once I placed myself in the midst of a group of New Guinea savages and listened to their pow-wow, and as I listened to it, there were certain sounds with which I was more or less acquainted after four or five years, and I think I do fairly well, because I can translate the words for them over into the equivalents which I myself know, but I start on some line of conduct based upon this belief of mine, and relate to my people what was meant by the pow-wow, and find that I get myself into a great many difficulties. In other words, I do not understand the finesse and nuance of their pow-wow." I think in a certain sense Dr. Clark's point of view is similar: that there is an enormous mass of small detail in the idiot pow-wow, and unless we can get down on our bellies and roll around on the floor with them, and stick our fingers in our noses, we do not know anything at all about their pow-wow. That is the most important thing Dr. Clark is bringing out: that the individual must try to mirror himself into the situation going on in the mind of the idiot; and mirroring himself, he may be able to get

¹ C. K. Ogden: *The Meaning of Meanings*. International Library of Philosophy. Harcourt, Brace & Co., New York.

the meaning of meanings of what they themselves are trying to do. I do not know that he is willing to accept this particular form of description of the process, but that is the way it appeals to me, and that gives it a legitimacy which to my point of view is worth subscribing to. "Every tub stands on its own bottom," every idiot is an individual problem, and as Dr. Potter said, there are idiots and idiots, and then still some more. This individualistic approach may be an illusion, but I think it is turning out to be a profitable illusion. Man lives by his illusions, as Ibsen has so well reminded us in his "Wild Duck," and so from my point of view, whether Dr. Clark wants to call it mental analysis, or psychoanalysis or analytical psychology is immaterial, except insofar as I agree with him that the psychoanalytical mode of approach is a valid and very useful mode of approach, and is the latest aid we have for understanding the meaning of meanings, and is the best way of getting at it. To-morrow we may have a better way of understanding the meaning of meanings; to-day we have not.

Dr. Adolph Stern said: I heard Dr. Clark read his paper at the New York Psychoanalytic Society last Tuesday, and if this is the same one, I will make my remarks about what I remember having heard at that time. As I understand it, the idiot that Dr. Clark is considering is one who has become such through a trauma, not the idiopathic idiot. In these cases some injury has been inflicted on the ego mechanism, and in its attempt to adapt itself to the environment, it has regressed to a defense mechanism. Clearly there is an hypertrophy of the ego, as Hollos and Ferenczi pointed out in the case of the general parietic, where the individual seems to take the injury to the brain as an assault upon his ego, necessitating in order to preserve himself an hypertrophy of that ego, as much as to say: "Nothing has happened to me; Look at me. I am very capable. I can do this. I am unlimitedly wealthy. I have enormous power." There is an hypertrophy to correspond to the trauma the individual has experienced, and it seems to me that the idiot does something similar. The idiot seeks emotionally in a wholly primitive way to get what he wants. You cannot really speak of regression in the case of idiots. There is no regression. The libido is a primitive sort and has never regressed, because it has never progressed, so that the idiot shows himself in a more or less natural emotional state.

I just heard the end of Dr. Jelliffe's discussion, and I feel that one cannot speak with any strictness in so far as one speaks of "psychoanalysis" in these individuals. It is not psychoanalysis except insofar as we feel that the approach to the study of the idiot is one based on psychoanalytical knowledge. The phenomenon of the transference so characteristic in psychoanalysis does not come into play in the case of the idiot. The idiot in the situation of treatment simply takes in his teacher or his love-object and then at any moment simply ejects him and withdraws *in toto* from that love-object. Once the object is introjected, nothing is done with it in the way of development or of adapting himself to the love-object. It takes it in, holds

it, and when it cannot use it, throws it out, and then the idiot becomes just as intractable as he was before.

As I remember Dr. Clark's remarks, those who treat the idiots under his care are individuals of the "dull normal" type. For my own part, I cannot see how anyone but a rather dull normal could spend hours and hours, weeks and weeks, struggling with the disappointments and the primitive, uninteresting material that the idiot presents in the way of treatment. Anyone who can do something with an idiot deserves a great deal of gratitude.

Dr. Joseph Smith said: In this discussion nothing has been said in regard to certain anatomical considerations which we should take into account when dealing with the question of idiocy. One can approach some cases from a purely psychoanalytic standpoint, but we know that there are gross brain alterations in idiocy which at once would rule out the question of psychoanalytic approach, since we could explain many of the symptoms, such as the low level of intelligence of these patients, on anatomic grounds. Secondly, as Dr. Stern has already said, the principles of psychoanalysis which we employ in the study of the primitive emotions and ideas of narcissistic neuroses cannot be made available to the understanding of idiocy, because the idiot has not progressed to a sufficient extent and then regressed to a primary stage of development, but in his emotions and intelligence has remained at the lowest possible level. Neither in his paper nor in the discussion which followed has there been a clear separation made between idiocy and other defectives of a higher intelligence for we must remember that the mental age of the idiot has been placed at two years at its highest. Furthermore, a prerequisite to any psychoanalytic approach is an adequate intelligence on the part of the patient, hence we cannot apply psychoanalytic technique to the study of the idiot, not only in the sense of reconstructing of the individual which Dr. Clark himself does not claim, but even to get an occasional amelioration of the symptoms would be extremely improbable. To speak of *a priori* psychoanalytic principles would mean to start out with various theoretical considerations before the facts are brought out to substantiate them.

Dr. I. T. Broadwin said: Under well directed supervision the idiot may improve in his actions to a certain degree unless the idiocy is due to a progressive devastating organic process. As long as something is done to help him, and this also applies to all mental defectives, some improvement will follow. The improvement may merely amount to better habits of cleanliness. The severer the degree of mental defect, the more limited is the degree of so-called improvement. The manner of treatment or supervision is in direct line with modern psychological trends in pedagogy, *i.e.*, direct appeal to the needs of the individual.

Dr. Clark speaks of the psychoanalytic approach to the ego of the idiot. This statement must appear as paradoxical. I can more readily conceive of the ego of the higher grades of mental defect than of the idiot.

Dr. Clark replied: Apropos of the ego development, Freud has said that in the first six years of life the ego is sufficiently established and the personality is fully capable of taking on such a degree of enduring patterns that ecclesiastics have based the permanency of impressions in adulthood upon what the child learns at or before this period. The ego binding is so far advanced in its conception of reality that it is able to stand alone without panic or undue fear. I have recently put together a manuscript of several hundred pages illustrating the degree of advance in the integration of personality that is made by the child in the first three years of life. The amount of development known at this early age makes it possible for at least a dozen authors to give a fairly consistent picture of this period.

In answer to what Dr. Stern has said, that little or nothing has been done or can be done for these little patients, I would say we have already demonstrated that something has been accomplished. How permanent and what will next succeed to what we have already done only time can show. Apparently what I have merely casually commented upon in reference to the use of dull normals as a part of the analytic tutoring has been taken as one of the main tenets of my thesis. So far all my work has been done by very ably trained analytic assistants, but I do not despise the aid of dull normals in the work. We should remember that the dull normal so designated by Terman shows an I.Q. of 70 to 80 or thereabouts. Many of these are only dull by our limited intelligence-testing. In many living requirements they are often superior to the so-called normals. In other words, their sensibility to human relationships is of a very superior sort, as any one who knows them well will fully attest. In fact they are often extraordinary individuals as regards their emotional relationships. I am proud to count a number of them among my intimate friends. I agree with Dr. Potter that many of these seemingly dull persons have the capacity to understand the behavior of the idiot, which normals have lost or never have had. It is not dissimilar to the fact that schizoids are often able to give us better interpretations of precox productions than we ourselves can give. It often happens that the mildly neurotic are able also to give us a better understanding of neurotics and psychotics in general than many analysts. Indeed, many if not all analysts have sensitized fixation points in their own development that enable them to understand the modified reactions in their patients much better than so-called normals. And I am pleased to state that I rank myself with the understanding group. I am not so sharply demarcated from the idiot class that I may not sympathetically keep in touch with a wide range of human behavior of which the idiot's is not the least. This work of mine is not without a propagandic import inasmuch as it is hoped that it will aid us all over the field of the narcissic neuroses. Our work in this field will also teach us to rid ourselves of our own narcissism or so master it for the benefit of our patients that we may make more rapid progress in unravelling the mysteries of the narcissic states in which a certain degree of ego defects or undue narcissic fixations are inter-

woven in psychotic reactions. Trained intelligence alone will not do this as the lag in our knowledge of the precox has shown. We must remember that the idiot, like the ape and dog, belong to our mammalian world and the two latter types, perhaps, have so good and permanent fixations in their own egoistic patterns that no amount of narcissistic transference will enable us to break them down. So good an authority as Professor Yerkes has said that the ape is as fully able to talk as man, but we are not able to sufficiently induce him to do so. Aside from idle curiosity, perhaps no one desires to break down the narcissistic imbinding of the ego pattern of the ape or dog, as neither is compelled, nor do they seemingly care to live in our type of existence; but not so with the idiot. He is born in our midst and needs to embrace our expanding socialization if he is to live satisfactorily. By mastering our own narcissism we may be able to enter the closed narcissistic system of the idiot rather than at present pounding upon it from the outside and forming his deeper regressions into the most primitive infantile patterns of behavior reactions. There *are* regressive features in the idiot. It is only our own narcissism that fails to make it comprehensible to us. I can show the whole range of some of the precox-like reactions in idiots. The idiot has three years to regress. It is the establishment of the first five years of our existence, according to Freud, which lays the pattern for all neuroses. If that is the case, we have a pattern for over half of them. I have taken occasion to write a lengthy monograph so that other individuals may see what I have been laboring at in the developmental period up to three years of age.

FACIAL PARESIS AS A MANIFESTATION OF TUMORS OF THE UPPER HALF OF THE CERVICAL SPINAL CORD

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NATHANIEL E. SILVERMAN, M.B. (Tor.) (BY INVITATION)

(*Authors' Abstract*)

The signs and symptoms of tumors of the upper four cervical segments are both varied and numerous, and their diagnosis is often very difficult, simulating at times the clinical pictures of hereditary ataxia, combined sclerosis, Pott's disease, pachymeningitis, etc.

The variety of involvement of various cranial nerves is striking: choked disc, pupillary inequality, facial sensory disorders, absence of the corneal and pharyngeal reflexes, and nystagmus. The finding of facial paresis, however, has been little emphasized. It is referred to in Elsberg's book in two cases.

The analyzed material consists of ten cases. In seven cases lower facial paresis was noted, five of these were extramedullary and two intramedullary tumors. Two of these seven cases were autopsied; one was found to be extramedullary, the other intramedullary. The

facial nucleus and nerves on examination proved to be normal. There was no pathology above the foramen magnum which could account for the paresis, and in none of the non-autopsied cases was there any evidence of disease in the neighborhood of the seventh nucleus or its fibers and nerves. The question of hereditary or acquired non-paralytic asymmetry can be ruled out.

In attempting to arrive at an anatomical basis for this phenomenon, several pathways were considered. The facial musculature is a derivative of the second hyoid arch which has developed from the sphincter colli of fish and amphibia. It extends in man downward over the front of the chest. There is no evidence to show, however, that the platysma is supplied by spinal nerves as well as by the seventh nerve.

The sensory derivatives from the cervical plexus to the lower face, head and neck were considered, and perhaps are affected in the same way that the facial musculature is affected in trigeminal lesions.

Another possibility is a reflex through the gustatory system which descends into the upper cervical region with the fasciculus solitarius. That impulses of taste produce facial movements is well recognized and similar reflex movements, pseudo-affective in type, are known from the records of reactions of decerebrate animals.

These suggestions are offered in order to correlate the clinical findings and their relation to anatomical pathways. The fact that not all the cases showed this sign indicates that some specific mechanism is present.

Discussion: DR. KRAUS said: The clinical evidence which we have presented seems clearly defined. The explanations which we are able to give of these findings are not satisfactory. The fact that the facial musculature in lower animals is cervical in origin, and that the tumors are located in the upper cervical regions, led us to the idea that an association pathway within the nervous system may exist. However, we have no evidence for this at present.

CONCUSSION OF THE BRAIN

DRS. MICHAEL OSNATO AND VINCENT GILLIBERTI (BY INVITATION)

(Authors' Abstract)

Very early in our observation of concussion cases we became impressed with the difference in the nature of their reactions from those cases of post-traumatic psychoneuroses in which it had been definitely established that the head injury, if there was one, had not resulted in an actual disturbance of brain tissues as evidenced chiefly by unconsciousness. These differences consisted in certain objective findings present in the concussion group which were entirely absent in the psychoneurotic group. But, just as decided a difference, it seemed to us, existed in the nature of what are often

referred to as purely subjective complaints. It occurred to us that many of these symptoms in the post-concussion cases were so like some of those complained of by sufferers from the residuals of epidemic encephalitis that the resemblance at times was startling. As a result we became interested in the pathology of concussion of the brain and finally undertook a complete study of the situation.

Because Trotter's definition of the term concussion seems to be that which is generally accepted, we take the liberty of quoting it verbatim: "I may say at once that I use the term concussion, as I think it should only be used in the strict classical sense, to indicate an essentially transient state due to head injury which is of instantaneous onset, manifests widespread symptoms of a purely paralytic kind, does not as such comprise any evidence of structural cerebral injury, and is always followed by amnesia for the actual moment of the accident." There are two exceptions to be made to this definition in view of what we will have to say later. First, it is not possible to say in a given case of concussion "that the state is essentially transient" unless one recognizes that these words simply apply to the unconsciousness and the immediate paralytic phenomena which accompany or follow the unconsciousness. Secondly, of course, it is not tenable, in the light of what will follow, to advance the proposition that this state "does not as such comprise any evidence of structural cerebral injury." With these two exceptions we are prepared to subscribe to Trotter's definition of cerebral concussion.

Many textbooks on surgery, nervous diseases, and pathology, are a unit in saying that the pathology of concussion of the brain is not definite or does not rest on solid ground. Typical of this viewpoint are the statements to be found in the textbook on Legal Medicine by Peterson, Haines and Webster, that "nothing definite is found in concussion and the general cerebral congestion is also found when death is due to alcohol." The reason for this type of statement, which is very frequently encountered, is the fact that so few individuals die from simple concussion of the brain and the number of these cases which reach autopsy is so rare that the literature is practically barren. Most of the knowledge that we have about the pathology of pure concussion of the brain is deduced from a study of more serious brain injuries, such as laceration, contusion, etc.

Adami points out that the cerebral blood vessels rupture easily because they have a slight muscular coat and the brain substance offers little support. Cassasa's explanation of the mechanism of concussion depends on the identification of a "net work of fine fibrils connecting the external wall of the blood vessel with the surrounding brain tissue across the perivascular lymph space. Sudden over-filling of the perivascular lymph space with cerebrospinal fluid conceivably could produce a laceration of a vessel by tearing of its wall in the neighborhood of such a fibrillar attachment. Otherwise, without such an attachment, the laceration of a vessel surrounded by fluid could not be produced by any pressure exerted through that fluid which could only tend to compress the vessel but not lacerate it.

Such an increase of cerebrospinal fluid in the perivascular lymph space could be caused by the cerebrospinal fluid from the surface of the brain being driven into it by the pressure exerted by the change of shape of the skull—the result of a blow or fall. This change of shape under an area of violence is in the direction of flattening and diminution of space for the cerebrospinal fluid in that area. This fluid must find its way out of that area through the various sulci of the brain and in connection therewith such fluid as cannot find its way through these channels must find a way into the perivascular lymph spaces in the reverse direction of the normal flow of the cerebrospinal fluid in these channels.” Cassasa then refers to the experiments of Weed which demonstrate that the perivascular lymph space (Virchow-Robin space) is directly connected with the finer spaces about the cerebral ganglion cells. He now advances the theory that sudden physical distension of these periganglionic spaces by cerebrospinal fluid in these cases of concussion causes a direct physical change in the ganglion cell which may explain all of the phenomena of concussion of the brain. This simple change may occur without minute hemorrhages and explains the completely negative findings of some authors who have autopsied concussion cases. (Personal communication by Dr. Cassasa.)

Of considerable interest, because it gives us a clear picture of the late changes resulting from brain trauma, are the descriptions by Meyer and Tanzi and Lugaro. These residuals according to Meyer are “small foci of softening or defects of cortex in the base of the frontal or temporal lobes.” Meyer found not only the absence of glia margin beneath the pia but also an increase (broadening) of the subpial glia in the same brain. The diffuse effects mentioned by Meyer are very extensive indeed. One of his cases showed very extensive lesions involving many parts of the brain but particularly degeneration of the “median striæ Lancisii after destruction of both olfactory bulbs. The optic chiasm showed unmistakable semidecussation and the indirect scattered lesions, through the concussion were exceedingly extensive and involved mainly the splenium of the corpus callosum and the long paths—the fillet and the superior cerebellar arm. There was also slight implication of both fifth nerve roots and of the optic nerves.” This case was of special interest to our problem because aside from the palpable focal lesions which were present, these diffuse effects were present which Meyer felt were due to concussion. It is well to note, however, that Case 5 of Meyer’s series, which particularly brought out these observations, was a case in which there was a gross craniocerebral injury in the left frontal region with prolapse of brain fungus into the skin which later developed infection, and although there was no meningitis, pus was found in both lateral ventricles. In other words, even in Meyer’s series the same difficulty is found as was encountered in studying the cases resulting from war trauma in the series reported by Cushing, Head and others; namely, the injuries to the brain were much more severe than we have reason to believe occur in the simple case of concussion. For that reason the value of Cassasa’s case is difficult

to overestimate. More concerning the late results of brain injury is to be found in the work of Tanzi and Lugaro. While they appear to be ready to attribute a purely psychogenic origin to the cases of what they call traumatic neurosis, in the cases which they classify as "dementia traumatica," they describe the following lesions; "small, old hemorrhagic foci, transformed into cysts or into glial scars, diffuse chronic lesions of the nervous elements, chronic diffuse lesions of the vessels," and they end the discussion by saying, "One must admit that following trauma there may be localized gross lesions or very mild diffuse lesions following which a chronic process of gliosis and degeneration of nerve cells takes place."

The conception of traumatic encephalitis as a type of the encephalides is not new, but reference to the literature will disclose that the pathology is based on a study of brain injuries caused by projectiles or other forms of direct trauma, which involve also the skull and meninges. The encephalitis which ensues is seldom purely traumatic, because the descriptions refer to "abscesses of greater or lesser extent, with more or less diffuse inflammatory reaction, manifesting itself in the perivascular spaces by the presence of leucocytes and accompanied at the edge of the involved area by the appearance of numerous giant neuroglial cells. Necrotic lesions coexist with hemorrhagic ones producing serious involvement of the axis cylinders. In the neighborhood of the loss of substance necrotic lesions are generally extensive or may be widely disseminated. This type of traumatic encephalitis is well known. Unfortunately, however, it probably is of but little interest in connection with the subject of pure concussion."

Of course, the lesions in concussion of the brain and in epidemic encephalitis are different in certain very important particulars. There is, notably, the absence of any considerable neuroglia reaction and nothing of a really definite nature is seen in the other cellular elements of the nervous system. As would be expected, the concussion cases which come immediately to autopsy show the hemorrhagic and acute thrombotic picture mainly. Usually the disturbed blood vessel is in the periphery, the white or gray substance of the deeper parts of the brain being comparatively free from injury. The pia arachnoid suffers most. These points are illustrated by the remarks of Greenacre concerning fifteen selected cases of traumatic pontine hemorrhage, twelve of which were associated with basal skull fracture of the posterior and middle fossae. Greenacre described the hemorrhages as being almost uniformly punctate, frequently grouped around the periphery of the pons, and connected with small subpial extravasations and numerous lacerations. That is about all that one can find by staining the sections in those very rare cases which come immediately to autopsy, but of course there is abundant evidence to show that later glial proliferation and the various stages of sclerosis of the ganglion cells are seen, together with evidence of degeneration in the axis cylinders, dendrites, etc. Meyer refers to the process as a typical Wallerian degeneration. It must be understood, however,

that these secondary degenerative reactions probably occur very rarely indeed. Surely the vast majority of cases of concussion recover with almost complete resolution of the diffuse hemorrhagic process, even granting that this occurs to a varying degree in every case of brain concussion. It has not been realized, perhaps, how many people in the general population have suffered concussion without, however, so far as one is able to judge clinically, showing any lasting effects. Taking into consideration the number of children who have had falls with resultant head injury and varying degrees of the concussion syndrome, and then on into boyhood, the great number who have concussion in consequence of injuries while at play, including also those who in adult life fall from horses, suffer automobile accidents and injuries of various kinds with head injury and concussion, one can form a picture of the enormous number of individuals who have, at some time or other, suffered a concussion of the brain. All authorities agree and our own experience confirms the opinion that permanent disabling clinical phenomena following concussion of the brain, with or without fracture of the skull, are not commonly encountered. The experiences of many who have dealt with war wounds of the skull and brain where gross craniocerebral damage was present has been that the number of cases of traumatic insanity or epilepsy, or of brain tumor which develop following such injuries, is surprisingly small indeed. This applies with even greater force to the pure concussion cases. Nevertheless, where the hemorrhagic process has been so marked and so diffusely present as in one of Cassasa's cases which has been studied by us, it cannot be otherwise than that certain mental and neurological disabilities, chiefly the former, may follow, developing apace with the secondary diffuse glial and ganglion cell degenerations. The degree of this diffuse secondary process will, of course, determine the nature and degree of the clinical phenomena, with one very important reservation. Sooner or later, certain instinctive influences operate to produce a group of emotional symptoms which it is difficult not to classify as purely psychogenic in origin. A discussion of these factors we shall not undertake at this time. Suffice it to say that in epidemic encephalitis or any other organic disease of the central nervous system, emotional situations can and often do add a purely psychogenic coloring to the picture, and cases of cerebral concussion are no exception.

Discussion: DR. LEON H. CORNWALL said: Through the courtesy of Dr. Charles B. Cassasa, Assistant Medical Examiner of the City of New York, I have been privileged to examine the brain of a case of concussion. The specimen came from a young man of thirty, who was knocked from a motorcycle on Fifth Avenue and rendered immediately unconscious. He was taken in an ambulance to a hospital where it was deemed wise to perform a decompression. While on the operating table his condition became serious and the operation was stopped. Death occurred within thirty-six hours after the accident, and the post-mortem examination was performed by

Dr. Cassasa within twenty-four hours following death. There were no fractures discovered by Dr. Cassasa. The brain was received by me, after having been sectioned and preserved in formalin. The weight was 1400 grams. The conformation was normal. The leptomeninges covering the whole brain were milky and edematous, more especially over the convexity of the cerebral hemispheres, and there was moderate distension of the pial veins. There were small petechial hemorrhages scattered through the centrum ovale, corpus callosum, and pons. These were especially marked in the corpus callosum. On microscopic examination of the hemorrhagic areas some of the red blood cells were basophilic in reaction, having an affinity for the hematoxylin stain. Sections from all parts of the brain, except the cerebellum, revealed a vacuolated appearance. The brain tissue appeared spongy or honeycombed in character. Large clear spaces were present around the blood vessels, ganglion cells and glia cells. In some instances two or three glia cells were in the center of a clear space. The ganglion cells were elongated and appeared compressed. One is always loath to attribute too much importance to the vacuolated appearance observed in this brain because of the possibility of its being due to artefact. The fixation had been accomplished by means of 10 per cent commercial formalin, which is routinely employed for all brains by the medical examiner's office. I was informed by Dr. Cassasa that a similar condition had been encountered only in five brains seen by him. The moth-eaten appearance of this brain is unusual in my experience with formalinized brains, which includes the examination of specimens that have been preserved as long as fifteen years. The rarity of this condition, therefore, and the diffuse distribution throughout the brain inclines me to attribute pathological significance to it. A second feature of interest was the presence of fibrin thrombi in the vessels of the meninges, chorioid plexi and cortical vessels. Such thrombi are frequently encountered as post-mortem changes in the cavities of the heart and in the branches of the aorta and pulmonary vessels. Such agonal thrombi however do not completely fill the lumina of the vessels in which they are situated. In this case the thrombi completely filled many of the vessels and were intimately attached to the intima. Another unusual feature was the basophilic staining reaction given by these thrombi. Ordinarily, fibrin stains with eosin and not with hematoxylin. A similar tinctorial reaction was noted in the walls of some of the smaller blood vessels. The tinctorial reaction observed was similar to that given by lime salts and we have deduced the tentative conclusion that as a result of the *commotio cerebri* there was a disturbance in the colloidal equilibrium of the calcium in the blood stream facilitating its precipitation. Many fat emboli were encountered in the smaller capillaries of the brain. These were demonstrated in sections treated by the Marchi method and embedded in collodion, and also in frozen sections stained by the Herxheimer technique. In the absence of fractures in this case it would seem reasonable to assume that the trauma to the medullary substance of

the bones was sufficient to have produced this response which is ordinarily associated with fractures. With the Mallory stain the red blood cells, both intra- and extra-vascular, were metachromatic in staining reaction, some being stained orange and others a bluish tint. Many of the clear spaces in the tissue stained a delicate blue with the Mallory stain. The Purkinje cells of the cerebellum showed a great variability in their reaction to the Nissl stain. In the same field some were chromophilic, others chromophobic and others achromatic. This finding was constant throughout the cerebellum. No hemorrhages were encountered in the cerebellum, nor was the moth-eaten appearance noted.

The pathology observed in this case requires that we refuse to accept a definition of concussion which describes it as a condition due to trauma associated with transitory clinical symptoms, chief among which is unconsciousness, without any permanent organic defect in the nervous tissue. In the cases that recover it is impossible to say that there has not been any permanent organic damage. The only statement that is justifiable concerning this is that organic damage, if present, may not evidence itself by organic signs or symptoms.

DR. C. O. FIERTZ (by invitation) said: In this connection I would like to draw your attention to what appears to me to be the most profound work on the concussion problem that has appeared for the past few years. I mean the studies of Ritter who in quite a series of articles has tried a separation of the so-called concussion of the brain into three different clinical entities. As a theoretical base for his conceptions he of course used the experimental work of recent years, especially that of Breslauer and Kocher and Rahm. Breslauer showed that compression, which in general is considered as being the main factor in the concussion, may produce loss of consciousness if applied upon the medulla oblongata even if it works with much less intensity than would be necessary to produce cortical lesions. He experimented on animals, especially on dogs, and found that compression when acting in the direction of the medulla instantly resulted in unconsciousness, coma, or even death; whereas local compression of cortical areas was without any effects upon the consciousness of the animal. He tried local compression by means of injections as well as by direct digital compression.

Ritter studied the material obtained at the surgical clinic at Zurich, Switzerland, during the past twenty-five years and thus was able to work with over 600 cases. An extensive clinical study showed that in the term concussion was embraced an entire complex of various disorders and troubles which made so very difficult a definite statement upon actual treatment and the prognosis. He therefore tried to analyze these conditions and succeeded, as it seems to me, very well in establishing three different well defined clinical entities each having its own clinical picture, proper symptoms, and a prognosis and duration of its own. He differentiates *commotio medullae oblongatae*, *commotio cerebri sensu stricto*, and *contusio cerebri diffusa*. I will try to outline very briefly the characteristics of these three entities.

Commotio medullae oblongatae: The symptoms of this concussion of the medullae are unconsciousness, disturbances of respiration and circulation, vomiting and changes in the blood pressure; in brief, nothing but symptoms referable purely to the medullae. Loss of consciousness is its outstanding feature, it is constantly present and always accompanied by the retrograde amnesia. The distinguishing characteristic of this picture is the short duration of all these symptoms and that they are the most pronounced at the very beginning, that is, immediately after the trauma. In other words, we have to deal with nothing else but the pressure curve of Kocher read backwards showing its full development at the beginning and then gradually vanishing. The after effects of this medullae concussion such as general weakness, rapid fatigability, lack of concentration, labile mood, dizziness and headache are of transitory character only and with time they vanish completely without leaving any residuals. It has been found that about 65 per cent of such cases did not show these after effects at all and in those cases where they were present the duration was a very short one lasting on an average of three to six months, the maximum being three years. The average time needed for recovery was twenty-nine days.

Commotio cerebri sensu strictiori: This concussion of the brain in the strict sense of the word is characterized by the presence of definite cortical symptoms. Its symptoms are vertigo, swaying gait, headache, malaise, loss of appetite. There occur quite irregular irritation symptoms of the cortex, such as slight twitchings of the limbs, of the face, mild pupillary differences, etc. Alterations of the pulse as well as loss of consciousness and retrograde amnesia are very inconstant. If loss of consciousness is present it may persist up to ten hours, whereas in the medullae concussion its duration is in general but a few minutes and the maximum of about four hours but very seldom reached. Important for the differential diagnosis is the absence or at least not constant presence of a primary affection of respiration or circulation, the only rare occurrence of vomiting and never any rise of temperature. In this form are characteristic the after-effects which almost constantly occur after the initial period of shock and depression or mental inhibition, as one would call it, lasting on an average three to four days, which is followed almost regularly by a period of exaltation, lasting about four to five days. The after-effects are complaints of headaches, dizziness, fatigability, general dullness, flickering of vision. The recovery takes an average of 54 days and the remaining symptoms last on an average of about 19 months, the maximum being five years. The most important of the remaining symptoms is the so-called encephalosis which is characterized by a true weakness of memory and by marked headache and dizziness, and general impairment of mental efficiency.

Contusio cerebri diffusa: In many instances there is but a gradual difference between this form and the concussion just mentioned, but it is characterized by the presence of definite focal symptoms of an affection of cortical areas. Those focal signs may be but

very slight and in general are of very diffuse character. We may have irritated and paralytic symptoms of the motor and sensory areas, auditory, visual, olfactory disturbances, agnosia, apraxia, aphasia, disturbance of vegetative nervous symptoms, etc. All these symptoms are multiple, profusely scattered and inconstant in their localization. They may vanish in one region and appear somewhere else. It is typical of these initial symptoms to last but a short time; they may disappear in a few hours, sometimes in two or three days. Disturbances that last longer must be considered as being conditioned by more severe local lesions. There occurs an almost constant elevation of temperature up to about 101 which may persist for about a week. The duration of the after effects, which of course in this form are more marked than in the other two, is rather long, sometimes five to ten years, sometimes remaining for the whole life. The average time of recovery was 98 days.

You see there are three well defined characteristic entities and these clinical differences are matched by the anatomical findings. The concussion of the medullæ does not reveal any sign in the microscopic examination, therefore proving Breslauer's statement that a pressure upon the medullæ may be disastrous in this region, whereas it is much lower than the stimulus threshold for a cortical lesion. In the second form we find degenerations of the fibers as a lasting and remaining feature, but in general only signs of an acute alteration of the nerve cells which in general are restituted. Characteristic is the absence of hemorrhages as has been emphasized long before by Roussy, Lhermitte and Cornil, Jakob and Bikeles. In the contusio cerebri of course we find several kinds of alterations of the tissue, especially small hemorrhages and their sequellæ.

As to the very interesting paper we have just heard, I would like to add but a few words. This comparison of symptoms in concussion and encephalitis is of course very striking but how would it be to make the same comparison in the same patients in two years? I think then things would be entirely different. After this time a great many of the symptoms now present will have disappeared and then the clinical feature of those two diseases will show marked differences. It is Von Monakow who always emphasizes the principal and fundamental difference between traumatic lesions of the brain without infection and without toxic influences which all have a good prognosis, and the infectious inflammatory and toxic diseases of the brain which very rarely only lead to a full recovery and in general are liable to produce lasting symptoms.

DR. A. M. RABINER said: The cases referred to were associated with trauma, but pathologically proved to be typical epidemic encephalitis. I do not think they can be considered in the group under discussion to-night. I was rather interested in this attempt to compare groups of patients with epidemic encephalitis and cerebral concussion. A study of the physical signs, however, would not reveal such a similarity as disclosed by the tables, of the subjective complaints. After all such symptoms as weakness, headaches, vertigo, etc., occur in many other clinical syndromes unassociated with

trauma or encephalitis. And so conclusions are not definite when comparison is made only as to subjective complaints between two clinical entities, one known to have definite pathology, and the other with no proven pathological changes. The case studied by Dr. Cornwall reveals interesting changes. His work, however, was done many months after the autopsy, and such uniform vacuolization may be artefact.

DR. IRVING H. SANDS said: If anything was proven to-night, it was the fact that the term "concussion" is a mighty poor one, and should never be used. It is true that it was arbitrarily used to describe those cases showing neuropsychiatric reactions after some insignificant trauma where we were morally certain that there had occurred no anatomical alterations within the cranial cavity. However, those who have had clinical and pathological experience have long become convinced that no one can at any time definitely say that a given patient who has received a blow on the head did not have anatomical changes in the brain. I have been privileged to follow neuropsychiatric cases in the late war and have been following them since then in the U. S. Veterans' Hospital No. 81, New York City. I have also had the good fortune of doing the cerebrospinal post-mortem examination of the cases at the Jewish Hospital. The greater my experience, clinical as well as pathological, the more convinced do I become of the fact that a great injustice has been done to those who have sustained cranial injuries. Especially is it true at present, when everybody regardless of qualification in training or experience speaks in psychological terms, and because of much verbal imagery, quite vociferously. Such opinion is accepted without any challenge. I have seen cases who for four or five years were being regarded as hysteria develop definite hemiplegias and other signs of organic brain disease right under our own eyes at the Veterans' Hospital. (See "The Rôle of Trauma in Neuropsychiatric Disease," U. S. Veteran Bureau Med. Bull., 1:32, Sept. 1925). The extent of the injury to the brain as a result of a fall or a blow on the head will depend upon many factors among which are the age of the patient, the condition of the blood vessels, the distance through which the person fell, the strength of the force of the blow, the angle at which the force was directed, etc. One can never fully determine the extent of the injury until the brain has been thoroughly examined at postmortem. In 1904, Meyer (*Amer. Jour. Insan.*, 60:373, June), called attention to the fact that there are several places where the brain is apt to be injured whenever the skull is struck, namely the tips of the temporal lobes, the orbital surface of the frontal lobes and the area around the third ventricle. We also found that the pons was frequently the seat of injury, and often there is extensive subpial hemorrhage. The vacuoles to which Dr. Cornwall has called attention were present in our cases and are due to the fact that with the impact of the blow the cerebrospinal fluid is forced out from the Virchow-Robin lymph space into the pericellular space, and the vacuoles represent the distended pericellular space. We have also seen the ruptured capillaries which were shown by Dr. Cornwall.

It is difficult to prognosticate in these cases; and often a person with very extensive frontal lobe injury may live for many years, while another with a relatively small pontine and medullary hemorrhage will result in death. Furthermore, the fracture of the skull *per se* may mean a favorable result as it acts as a decompression operation.

DR. GILIBERTI (closing the discussion) replied: Dr. Rabiner mentioned the fact that he would be interested to know the difference a few years afterward in symptoms of the cases of concussion compared with the cases of encephalitis. As I stated in the body of the paper, the lesions of simple concussion show a great tendency to resolution and practically all the patients get entirely well. If they get rid of their symptoms, and we are trying to explain the symptoms on the basis of organic brain lesions, as our slides demonstrated, then their brain lesions must have improved; whereas in the case of encephalitis with residuals the tendency is for a chronicity of the lesions, and naturally the symptoms continue because the pathology in the brain remains practically unaltered.

In regard to the other gentleman who mentioned cases of concussion without loss of consciousness, I cannot quite understand that condition, because cerebral concussion, according to the definition ordinarily accepted, has as one of its principal manifestations loss of consciousness. In addition, he divides the various forms of cerebral concussion into three groups as evidenced by focal symptoms. Of course, you can subdivide these cases of concussion into any number of groups depending on the prominence of symptoms in different parts of the brain, but simple concussion means concussion of the entire brain, because it is inconceivable that a blow to any part of the skull causing a sudden and momentary increase in the intracranial pressure can affect only one small area of the brain and not the entire contents of the skull, because the hydrostatic pressure would be the same all over. The reason I think there is more hemorrhage in one part than another depends on possibly the strength of the fibrillar attachments to the perivascular walls and other inherent characteristics of the particular brain in question. In addition I wish to state that whether there is a fracture of the skull or not has no very great significance except possibly that its existence may be in favor of the patient. A given blow of a certain intensity to a skull of a certain strength, if the skull fractures, in so doing will probably tend to protect the brain underneath, unless a depressed fragment of the skull lacerates the brain; but if the skull does not give way, there will be a greater momentary increase in intracranial pressure and greater symptoms will result. Those cases of penetrating wounds which Dr. Sands mentioned are easy to understand because the damage was sharply limited and not widespread enough to bring about a condition of true concussion in spite of the fact that a small part of the brain tissue was actually damaged.

GENERAL MEDICAL CONGRESS FOR PSYCHOTHERAPY,
BADEN-BADEN, APRIL 17-19, 1926

The Congress gratified its medical constituency, first through as rigid as possible an exclusion of the laity from among its audiences, and then through the measures put into effect by its external leadership (Eliasberg of Munich, Hahn of Baden-Baden) that news should be given out to the general press only through medical interviews. Participation in the Congress was exceedingly lively, so that the number who took part comprised almost five hundred persons. The presence of Sommer (Giessen) as presiding officer assured the character of the entire session, while the external impression was heightened still further by the coöperation, in part in the chair, in part through the addresses, of many representatives of various medical faculties (v. Bergmann, Moro, Walthard, Mayer of Tübingen; Kehrer of Münster, and others) and the collaboration of important persons from abroad (Schilder of Vienna; H. W. Maier of Zürich; Kläsi of Basel; Boumann and Jelgersma from Holland; Bjerre from Sweden; and others).

The first duty of the Congress was to present the manifold and vital activity which now exists in psychotherapeutic matters, and the possibilities for unified action which are at hand. With this purpose, the three days of the Congress were taken up with twelve principal reports, in part given by several speakers, the relation of psychotherapy to psychiatry being the first subject. Kehrer (Münster) presented this close relationship in a penetrating historical and systematic study, and Schilder showed from the analytic standpoint in which psychoses a psychotherapeutic influence might be considered. Due attention was given to all psychotherapeutic methods, although the discussion centered about the analytic. As in all that Schilder presents, his vitally active conception and his clear, critical defining of the position indicated were particularly pleasing.

Hansen (Heidelberg) gave in the next paper a survey compact with the problems of the relations between psychotherapy and internal medicine, and containing special reference to the historical and scientific-theoretical development. Schwartz (Vienna), who was to have answered him, was prevented at the last moment from appearing.

Walthard (Zürich) demonstrated by very successful film photographs the relief of vaginal tension through innervation of abdominal pressure and, in a joint report with the psychiatrist H. W. Maier (Zürich), was able to confirm the extraordinary appropriateness of suitable coöperation on the part of psychiatrists and gynecologists. A. Mayer (Tübingen) brought vivid pictures from the practical work of the gynecologist in psychogenic disorders. "Incisions into the psyche are hazarded, just as into the body." This statement characterizes his position.

The second day's proceedings contained a clear and profound review by Sommer (Giessen) of the relationship of experimental psychology to psychotherapy and a lucid general discussion by Allers (Vienna) concerning psychotherapy and psychopathology. The third speaker, Ranschburg, was prevented at the last minute from appearing. The rest of the day was devoted to the theme of psychotherapy and skin diseases (Sack of Baden-Baden), psychotherapy and questions of constitution (Jaensch of Frankfurt a. M.), psychotherapy and pediatrics (Gött of Bonn and Husler of Munich), and also to the problems so exceedingly important to physicians everywhere, "Psychotherapy and Quackery," and "Psychotherapy and the Money Question" (Grünthal of Berlin, Seif of Munich).

The third day of the Congress was opened by a profound and most intellectually conceived address by v. Weizsäcker, in which the problem of psychotherapy and clinical medicine was considered in comprehensive relation to intellectual development; and it was particularly pointed out that in the history of science we stand, according to all the signs of the times, at the beginning of the building of a new system, in the elaboration of which the psychotherapeutic question bears an essential part. J. H. Schultz (Berlin) attempted to give a brief survey of the efforts for unity in psychotherapy, especially in the sense of his "Fateful Hours of Psychotherapy" (*Schicksalsstunde der Psychotherapie*).

The important problem of accident neuroses and psychotherapy found warm-hearted exponents in Kläsi and Eliasberg. Surely there is still need here for much explanatory and critically progressive work. Hahn (Baden-Baden) gave a brief presentation of psychocatharsis, and Simmel and Stekel reported upon the problem of reëducation (*Ausbildungsfrage*). The third speaker, Kronfeld, was unfortunately prevented at the last moment from being present.

Even this brief review of the chief addresses permits us to realize that the most serious questions were considered from all sides at the Congress by the best representatives of our specialty. This certainly was most important for the first congress, although at times the listeners would gladly have tarried longer by some point and would have liked a more intensive discussion. Here and there one heard it said that less would have given us more. No sort of an alliance in the sense of an organized society or union was determined upon, although after mature discussion, but only another meeting in a year and the printing of the papers were arranged for. Sommer (Giessen) was chosen as first president for the next Congress, Goldstein (Frankfurt a. M.) and J. H. Schultz (Berlin) as vice presidents, Eliasberg and Haymann as secretaries, who, in close sympathy with a larger working committee, will prepare, let us hope, for as fruitful and stimulating assembly next year. [J. H. Schultz (Berlin), D. M.]

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

2. ENDOCRINOPATHIES.

Rogers, John. "SURGICAL NEUROSES OF THE THYROID GLAND."

Hyperthyroidism is manifested chiefly by neuroses. In general, a neurosis is the result of defective or deficient biochemistry, or the equivalent of a failure and not an excess of nutrition. The product of the thyroid is evidently essential for the nutrition of all tissues, including the nervous system; yet when there is a superabundance of its product the nutrition fails. Consequently, it is more reasonable to believe in some failure in the automatic mechanism which must control the activity of the thyroid and its product than in any primary and vicious overactivity of this gland; or the thyroid may be, at the outset, inadequate to perform its functions and, in responding to stimulation, make a secretion which is excessive in quantity but defective in quality. The probability of some initial failure must not be forgotten. Experience with the fully developed hyperthyroid neuroses as with the corresponding gastric neuroses after ulcer formation, has proved that surgery is necessary, but it should be as conservative and protective as possible. The prevention treatment, and especially treatment following operation, should coincide with reënförment, so far as they are known, of the deficient physiological materials.

Clinically, the disease in the great majority of cases does not spring into existence suddenly. It does not begin nor end in the neuroses which are characteristic of a typical hyperthyroidism. It is usually first noted after a considerable period in which there are signs of deficient thyroid activity, or hypothyroidism. The symptoms are manifested by a failure in the functions performed by the autonomic portion of the involuntary nerves. (This particular group would be more generally understood if it were designated by the name of its most prominent member, or as the vagus system.) The most noticeable features are the pallor, or failure of the vasodilators; the failure in the gastrointestinal tract; and the failure in mental and physical vigor. Hypothyroidism can be distinguished from chronic fatigue only by the enlargement of the thyroid.

Following the initial stage of hypothyroidism there is usually an intermediate period in which the autonomic or vagus system is at times more active and at others less than normal. The vasomotor apparatus is unstable. Sooner or later it becomes constantly overactive, with an evi-

dent and constant hyperthyroidism. Exophthalmos may or may not then appear. Recovery, when it occurs, takes place in the reverse direction and convalescence is then accompanied by slowly decreasing signs of hypothyroidism. The symptoms which indicate deficient or excessive functional activity of the autonomic system are frequently interchangeable, and a patient at one time may be frankly hyper and at another hypothyroid. Thus, clinically at least, all the functional diseases of this gland are closely related, and the chief factors which influence the alterations and alternations are fatigue and rest. Fatigue accelerates and intensifies the advance from hypo to hyper, and rest the retrogression from hyper to hypo. This means that fatigue apparently makes the autonomic system overact, or functionate exactly as it should not and this in itself suggests some failure elsewhere.

Experimentally, all noncoagulable extracts of the thyroid stimulate the functions believed to be performed by the terminal filaments of the autonomic system, especially the vasodilator and vagus portions. No derivative of the thyroid (except after long continued administration) will excite any appreciable degree of tachycardia. This most characteristic sign of hyperthyroidism must, then, be caused either by the generally increased metabolism, or by that of the heart muscle itself. All derivatives of the adrenal gland excite exactly opposite reactions, especially in the vasomotor and vagus portions of the involuntary nerves. They stimulate the functions believed to be performed by the terminals of the sympathetic. Feeding dogs with adrenal extracts makes the animal's gland gain enormously in its content of iodine. This is an exceedingly important observation because the neuroses of hyperthyroidism seem to increase in severity in direct proportion to the decrease in the iodine content of the diseased thyroid. Feeding with the crystals of adrenalin has no such effect. That is, the derivatives or extracts of the entire gland stimulate the functions of the sympathetic system much more vigorously than does adrenalin. These functions which are apparently performed by the sympathetic terminals in conjunction with the product of the entire adrenal gland can be briefly expressed as those of "check." The thyroid product, on the other hand, in conjunction with the autonomic or vagus terminals, seems to perform the duties of "drive." The products of other organs also thus participate in the physiological drive and there are some reasons for believing that the pituitary helps in the check. But in the thyroid neuroses they are only now and then to be considered.

In the presence of a goiter, too much visceral drive means hyperthyroidism, and too little, hypo. The initial failure in the drive, as stated previously, is usually followed by a stage in which, under excitement or fatigue, there is an evident excess of drive, which with quiet and rest soon changes to too little. Later on, in typical hyperthyroidism, the excess of drive becomes constant. These alterations can be interpreted as a primary failure in function, generally from fatigue, of all

the terminals of the autonomic (or vagus) system. This system is believed to supply the thyroid, and the latter should therefore also fail. There are some experiments which seem to indicate that the sympathetic and not the vagus activates this gland. But the sympathetic supplies the vasoconstrictor nerves and its stimulation by feeding derivatives of the entire adrenal gland is the only possible explanation for the thyroid's gain in iodine. Hence, if only because of the uniformity in the antagonism between the vagus-thyroid and sympathetic-adrenal or chromaffin systems, it is more reasonable at present to believe that the vagus and not the sympathetic drives the thyroid. The initial disturbance, then, seems to be a failure most often due to fatigue (though it may sometimes be the result of toxemia) of the terminals of all the involuntary nerves. The preponderance of the failure then takes place in the sympathetic, and the thyroid and other viscera lose their balance between the automatic drive and check. The latter shows an increasing failure and the thyroid "runs away." A simpler hypothesis assumes the primary failure to be in the thyroid itself. It is inadequate and responds to stimuli by multiplication of its epithelium with an increase in the quantity but a decrease in the quality of its secretion. Some cases, especially those with a small or imperceptible goiter, are very suggestive in their history of a primary defect or failure in the involuntary nerves; others of a primary thyroid defect because it enlarges before there are any appreciable neuroses.

The surgical treatment of hyperthyroidism must take into account the probable remote causes of the disturbance, and then the location and distribution of the pathological alveoli which seem to be its immediate excitants. If all of the abnormal cells can be excised, the hyper symptoms quickly subside into the hypo.

Clinically, there are three main types of hyperthyroid glands:

1. Characterized by diffuse symmetrical enlargement of even consistency throughout. Here the pathological alveoli are distributed equally in all parts of the gland.

2. Characterized by a diffuse enlargement with denser consistency and more vascularity confined mostly to one side or one lobe and the isthmus. The hypertrophied tissue generally, then, contains the greater part if not all of the pathological alveoli.

3. Characterized by a localized tumor with the remainder of the gland of more or less normal size and consistency. This is the so-called toxic adenoma.

Unfortunately, this type of gland may contain many and not a single toxic tumor, but if they can all be excised the hyperthyroid symptoms subside promptly into the hypo. In addition to the removal of the single or multiple tumors, the two superior vessels should always be tied.

Type 2 requires a similar simple operation or removal of the pathological lobe with its offending alveoli.

Type 1, or that in which the consistency and outline of the gland sug-

gests an even distribution throughout the whole organ of the pathological alveoli, cannot be so easily handled. This type is the most frequently complicated by the exophthalmos which, though of unknown origin, adds greatly to the gravity of the prognosis.

The common procedure is to remove two-thirds or three-quarters, or even more, of the organ. This disregards every conception of its nutritive and energy-promoting functions, and if too many of the pathological alveoli remain the hyperthyroidism will persist. If too few, that is if too much of the gland is sacrificed, what remains may be incapable of sufficient regeneration to restore even an approach to normal vigor. In these uncertainties the author has practiced, in over five hundred cases, the ligation in two stages, under local anesthesia, of all four of the chief thyroid vessels. The recovery is much slower than after excision of all or the major portion of the pathological alveoli, as in the toxic adenoma cases, but it is safer and better than the extensive and radical resections which so often fail.

The ligation and excision operations if the hyper signs persist should always be supplemented by adrenal feeding to help the thyroid hold and properly metabolize its iodine. At the same time, it is logical and beneficial to add a couple of drops of the ordinary tincture of iodine in a half glass of water once daily. If the administration of iodine makes the gland swell or is accompanied by a feeling of tightness or pressure in the neck, the intervals between doses can be made every two or three days.

After the quadruple ligation operation, recovery can often be much hastened by two or three treatments with the X-ray at intervals of a week. During convalescence from hyperthyroidism, as in the incipient period with its so-called mixed hypo and hyperthyroid neuroses and, of course, in the early period of evident hypo and the similar period in the later convalescence, thyroid feeding is decidedly helpful. The medicaments for either thyroid or adrenal feeding are commonly made by defatting and desiccating the entire gland. This is an extremely crude and uncertain preparation. The ordinary dried thyroid tablets, even in the smallest dose, will often excite an evident hypo into a hyper thyroid disturbance. A far better and safer thyroid product is the nucleoprotein material (Schieffelin) which is dispensed in one grain tablets containing 2 per cent (1/50 gr.), or 5 per cent (1/20 gr.), or 10 per cent (1/10 gr.) of iodized thyroid nucleoproteins. The 2 per cent tablet can be given with impunity, and often with great benefit, in the incipient and always in the convalescent hypo stages of the hyperthyroid neuroses. The noncoagulable part of the thyroid extract (thyroid residue) from which the nucleoprotein material has been removed is sometimes better tolerated and may be more helpful, especially in cases with neuroses which show gastroenteric deficiencies. Of the adrenal products, which are particularly beneficial for the hyper neuroses, the noncoagulable aqueous extract known as the adrenal residue (Schieffelin) is, experimentally, the most

active in causing the dog's thyroid to gain in its iodine content. Clinically, it is very valuable for allaying the hyper nervous irritability and tachycardia, in ten to fifteen drop doses every four hours, particularly if combined, as mentioned above, with a trace of iodine. The adrenal nucleoprotein material is not quite as active, but more easily handled. It seems to have more effect than the adrenal residue in allaying excessive activity in the gastrointestinal tract.

A few cases of incipient or convalescent hyperthyroidism with headache seem to do better with pituitary than with either thyroid or adrenal feeding. It should always be considered that surgery, though essential in the treatment of hyperthyroidism, should be conservative, and is but one of the many factors which should aid in a perfect recovery. (Author's abstract.)

Degener, L. M. STUDIES ON THE EFFECT OF DIET ON THE WEIGHT OF THE HYPOPHYSIS AND THYROID GLAND OF THE ALBINO RAT, AND ON THE ACTION OF THEIR EXTRACTS ON THE ISOLATED SMALL INTESTINE. [Am. J. Physiol., Vol. LX, p. 107. Med. Sc.]

Feeding experiments on 200 rats with different diets, namely: (1) oatmeal and milk, (2) vegetables, (3) meat, (4) standard diet plus potassium-iodide, (5) standard diet plus thyroxine. The effects of these diets on body weight, weight of thyroid and hypophysis, and physiological activity of the extracts from these two glands, were determined. No significant differences were observed. An interesting new observation is that the action of the two parts of the hypophysis in the isolated intestine is different and antagonistic. The glandular lobe extract causes a contraction, the nervous lobe extract a relaxation.

Curschmann, H. EFFECT OF WAR DIET ON GRAVES' DISEASE. [Klinische Wochenschrift, Vol. I, June 24, p. 1296.]

This author records that during the period of underfeeding in the recent war the number of cases of Graves' disease in his practice (hospital and private) in Rostock greatly diminished; also severe cases were less numerous. Other physicians in Rostock and Mecklenburg had similar experiences. Since the middle of 1919 (when the food, as regards meat and fat, rapidly improved) the number of cases of Graves' disease has rapidly and considerably increased. Similar improvement was produced by underfeeding in the war period as regards diabetes, gout, cholelithiasis, some forms of constipation, and obesity. During this period of underfeeding the author noted an increase in the number of cases of myxedema, and an increase of the symptoms in those already suffering. He quotes the experiences of twelve other physicians and surgeons in Germany who noted a definite diminution of the number of cases of Graves' disease, and especially of the severe cases, during the years of underfeeding. The cause of this diminution is carefully discussed, and the author concludes that underfeeding has a depressing influence on the functions of the

thyroid gland and that abundant feeding has a stimulating influence on the gland. Also he considers it is probable that not only meat but also fat and excessive feeding generally are able to lead to an increase of the function of the thyroid gland, and thus, in Graves' disease, probably to an injurious increase of the activity of the gland as regards internal secretion. These observations support the views of Blum as to the value of a diet free from meat in Graves' disease. (B. M. J.)

Frias, J. Bravo y. CONGENITAL FAMILIAL GOITRE TREATED WITH DRUGS. [Archivos Españoles de Pediatría, February, 1922.]

A clinical study of a case of a female infant, two months old, who had been born with a goiter so large as to cause frequent crises of asphyxiation, during which her head was always thrown backward. If it was turned forward the suffocative paroxysm became greatly augmented. The father and mother were both syphilitic, but no goiter had been known in either line nor in the village. Of ten previous conceptions four children, of whom only one was living, had had goiters at birth. None of the living children was luetic. The patient weighed less than ten pounds when six weeks old and had lost instead of gaining weight since birth. The goiter extended from the suprahyoid region to the suprasternal and touched the sternomastoid muscle on each side. At its largest the child's neck was twenty-three centimeters in circumference. The tumor was not adherent to the skin, presented no inflammatory signs, and moved with the larynx and on deglutition. The baby was small in size, showed decided hypertrichosis, a dry skin desquamating freely, wide open fontanelles, and a cranial measurement of forty centimeters.

The diagnosis made was congenital goiter with thyroid insufficiency, and the treatment was thyroid extract and mercurial frictions. Iodide of potassium was not borne. Improvement was slow and accompanied by the usual vicissitudes; but in six months all general symptoms had disappeared, the child seemed normal, was only slightly smaller than others of its age, had no hypertrichosis, and the goiter was so diminished that the head was held naturally. At twenty months of age the goiter was still perceptible and the fontanelle not completely closed, but general improvement was evident. The patient's sister, eleven years old, has a very large congenital goiter and suffers from severe crises of suffocation. She is not being treated and the tumor has made slow progress for the most part, but during the last year has increased rapidly.

Von Eiselberg. GOITER. [Deut. Zeit. f. Chir., Vol. CLXXII, No. 5-6, p. 285. J. A. M. A.]

Von Eiselberg remarks that there are few experiences which the surgeon can regard with so much satisfaction as his successful operations for exophthalmic goiter. In his 215 operative cases of exophthalmic goiter, the mortality was 3.7 per cent, but at first he operated only in the severest cases; 3 of the 8 fatalities were in the first.

4 he operated on. He insists on several days of repose and calcium lactate to prepare for the operation to resect the thyroid. If tetany develops and proves refractory to calcium salts and chloral, parathyroid grafts from children dying during delivery or from fatal accident cases may tide the patient along until his own accessory parathyroids can assume the functional task. The grafts are always absorbed in time. Sauerbruch reported excellent results from parathyroid grafts in the rectus muscle in 3 cases of postoperative tetany. Capelle reported 32 cases of postoperative tetany. It developed in 1.3 per cent after ligation of two arteries; in 1.9 after three arteries had been ligated, and in 4.4 per cent after ligation of four arteries, and the severer forms were all in this latter group. He thinks that this demonstrates that the tetany resulted from some interference with the nourishment of the parathyroids. As this corrected itself in time, the tetany subsided; it had disappeared partially or entirely in all his cases when the patients were dismissed. Before operating in exophthalmic goiter, Krecke insists on bed rest for several weeks and roentgen exposures of the thymus. He has never had tetany develop after an operation for recurring goiter although in one case five operations had been required. In Madlener's 93 cases in which he ligated four arteries, there was partial necrosis in one case of what had been left of the thyroid, and in another case fatal tetany. His experience has convinced him that, in districts far from the ocean, minute doses of iodine are necessary for the young, to a total of 0.1 gm. of potassium of iodide during the year.

Unverricht. THYROID AND PRODUCTION OF ERYTHROCYTES. [Klin. Woch., Vol. II, No. 4.]

In many anemic individuals arsenic alone does not seem to stimulate the growth of red cells. Unverricht has found that in such slow red building anemics, particularly found in tuberculosis and in individuals with hypothyroid signs, the addition of small doses of thyroid aids the blood-making function and materially augments the action of the arsenic.

Tinker, M. B. DESPERATE RISK GOITER. [J. A. M. A., Vol. 79, Oct. 14.]

This report is based on 1,000 cases selected from a series of 1,318 records of recent cases, under observation since May 31, 1914. In Tinker's opinion any case in which the patient is apparently faced with almost certain death unless relieved within a relatively short time might be classed as a desperate risk. Forty-two patients died without operation, either while under observation in the hospital or at their homes. The causes of death in these cases may be grouped as follows: hyperthyroidism with extreme toxemia; hyperthyroidism in association with diabetes; goiter with extremely high blood pressure; goiter causing death by obstruction to breathing, and thyroid malignancy. In Tinker's experience with the hyperthyroid cases, those patients with obstinate gastrointestinal symptoms, very high blood pressure and myocardial insufficiency have seemed especially desperate risks. When nausea and vomiting or diarrhea have

apparently resulted from thyroid toxemia alone, uninfluenced by diet, medication or other causes, and have persisted in spite of treatment, the patients, without exception, have died. Hypertension in combination with hyperthyroidism has also proved of decided gravity. He has considered as not suitable for operation any patient whose blood pressure has not dropped at least 30 points, nor has he operated on any patient with a blood pressure of more than 190, and generally the pressure has dropped to 170, or lower. These patients are most safely operated on under local anesthesia. Myocardial insufficiency, whether from poisoning of heart muscle or because of weakening from long-continued tachycardia, also puts some patients in the desperate risk class. Among the hyperthyroid cases are many patients without gastrointestinal symptoms, extreme hypertension or pulse deficiency that directs attention to the gravity of their condition, but who, because of extreme toxemias, are in desperate condition. In these cases the extreme unrest, tremor, insomnia, emaciation, dyspnea, edema and very rapid heart—most, or all, of these symptoms—are sufficient indication of the gravity of the condition.

II. SENSORI-MOTOR NEUROLOGY.

2. PERIPHERAL NERVES.

Gordon, Alfred. PHYSIOLOGY, PATHOLOGY, AND CLINICAL ASPECT OF INTERVERTEBRAL FORAMINA. [Annals of Clinical Medicine, March, 1924.]

The intervertebral foramina serve the purpose to protect the enclosed tissues from direct external injuries, otherwise the abrupt and sudden movements of the articular surfaces of the spinal column would easily do damage to the enclosed organs. The foramina are filled with an adiposo-allular tissue in which lie neurovascular bundles. The spinal nerve which lies horizontally in the foramen is formed of a union of a motor and sensory branch also of branches from rami communicantes of the sympathetic system. The intraforaminal nerve is extrameningeal and is covered only with a prolongation of the dura and consequently is not in contact with the cerebrospinal fluid. The seat of this nerve renders it subject to the influence of the surrounding walls of the foramina. The nerve may become diseased primarily or secondarily in cases of traumatic injuries to the bony structure surrounding it, especially when it is not protected by a subarachnoid space filled with fluid. A rheumatic, gouty or other toxic change in the bony tissue, Pott's disease, cancer, etc., are all apt to irritate, compress, twist, or pull the nerve. Being the result of union of the motor and sensory roots the symptoms will be: Pain of a neuralgic character, objective distribution of pain of the radicular type, also sympathetic phenomena such as enophthalmia, myosis, and narrowness of the palpebral fissure. The localization of pain depends upon the number of nerves involved. The motor disturbances will be:

hypotonia, a slight paretic state, muscular atrophy, increased tendon reflexes in the initial stage. The characteristic symptoms consist of the following three features: crossed inclined position of the spine with muscular contracture; increase of pain on lateral movements and tenderness upon pressure of the lateral points. Sicard and Foix (*Presse Médicale*, 20 Decembre) also called attention to the presence of so-called "albumino-cytological dissociation" consisting of hyperalbuminosis with negative lympho-cytosis in the spinal fluid. The therapeutic management of intervertebral neuritis depends upon the etiological factors which invaded the foramina or the enclosed packet of adiposo-cellular tissue which contains the nerve. Medications, massage, radiotherapy, systematic mobilization, hot baths at thermal stations—are all preliminary measures. If they fail, epidural injections of physiological saline solutions are to be tried. If the latter is not successful, laminectomy is the next step. In all cases the possibility of syphilis should be thought of in spite of the fact that this form of neuritis is extrameningeal. Tuberculosis malignancy should always be borne in mind in view of the proximity of osseous tissue. Antisyphilitic remedies, alteratives and strengthening remedies should be tried in all cases of doubtful localization of a vertebral affection accompanied by pain of more or less severe character before surgical intervention is decided upon. [Author's abstract.]

Friedenwald, J. S. THE VIRUS OF HERPES SIMPLEX. [*Arch. of Ophth.*, Vol. 7, March.]

J. S. Friedenwald makes a distinction between herpes zoster and herpes simplex. Evidence tends to show that herpes zoster is an infection by a specific organism closely allied to the causative agent of chickenpox, but this has as yet not been conclusively proved. In regard to herpes simplex the opposite is true. Under this term is included a variety of clinical forms such as labial, facial, genital or corneal herpes, all produced by a single specific infective organism. Though often occurring in the course of various infectious diseases, it is most frequently found as an isolated phenomenon accompanied by slight general malaise or low fever. In 1912 and 1913 Grüter produced in rabbits a violent keratitis by inoculating their corneæ with scrapings from the cornea of a patient suffering from dendritic keratitis. Later experimenters confirmed this finding and showed that the keratitis could be produced in rabbits by inoculation with material from any form of simple herpes, but not from herpes zoster. They further were able to transmit the disease from one rabbit to another with undiminished virulence. They could not demonstrate a visible organism but succeeded in passing the virus through a Berkefeld filter. Certain of the animals developed symptoms of a severe general disease, with paralysis and convulsions, often terminating in death, a condition strongly resembling epidemic encephalitis. Further experiments showed a definite relation between the virus of herpes and that of encephalitis.

The author goes on to report his own experimental work. He inoculated the corneæ of rabbits from patients suffering from facial herpes of different kinds and from patients with dendritic keratitis and produced lesions in twelve of thirteen rabbits. He inoculated also from other corneal lesions and from nasal and buccal secretion, normal and abnormal, and in fifteen instances failed to produce a lesion. The infection usually shows itself in eighteen to thirty-six hours after inoculation, runs an acute course and begins to subside on the seventh day. Among the fifty-eight rabbits successfully inoculated on the cornea twelve developed encephalitic symptoms and six died. The path of the virus from the cornea to the brain is probably along the sensory nerves of the cornea. Pathological changes were found in the brain, in the gasserian ganglion and trigeminal nerve.

Mercer, W. BRACHIAL PRESSURE NEURITIS. [Edin. Med. Jl., December, 1923.]

Three cases are described illustrating pressure on the dorsal root or lower trunk of the brachial plexus on the left side caused by (1) a normal first rib, (2) a narrowed intervertebral foramen, and (3) a cervical rib. The first, an ex-soldier, aged twenty-three, markedly neurasthenic, developed pain about the left shoulder shooting down to the fingers, following on some functional weakness of the limb. X-rays showed a cervical rib on the right side but not on the left. A fibrous band was diagnosed, but at the operation it was seen that the pressure was due to the sharp edge of the first rib. Resection of this portion of the rib, followed by massage, faradism, and exercise, resulted in complete recovery. The second, a male pianist, aged twenty, complained of a "tightening" and numbness of his left arm and hand. He was extremely thin and there was a lateral curvature in the lower cervical region with the convexity to the right. Narrowing of the intervertebral foramen in the concavity of the scoliosis was diagnosed, and the patient treated in bed with extension to the head, starting with three pounds and going up to nine pounds, massage, and Swedish remedial exercises. All symptoms disappeared. The third case, a female typist, aged eighteen, complained of severe pain in the left shoulder shooting down to the hand, following on an operation for tuberculous glands in the neck. There was marked wasting of the trapezius on that side, obviously due to injury to the spinal accessory nerve. X-rays showed a supernumerary rib, resection of which resulted in complete recovery. Common to all these cases in young right-handed adults was a general loss of muscle tone, causing a drooping of the left shoulder and pressure on that brachial plexus. When the immediate cause of the neuritis has been removed the author recommends ionic therapy with a 1 per cent solution of chlorine or potassium iodide, using a through-and-through current of forty to sixty milliampères for twenty minutes.

Hoffmann, E. SCLEREDEMA AFTER GRIPPE WITH CUTANEOUS NERVE CHANGES. [Kl. W., Vol. 2, No. 21.]

Hoffmann discusses this sequela of grippe as it appeared in two cases. In a seven-year-old girl the condition completely disappeared after some months. A woman twenty years of age also confirmed a good prognosis. Accurate histological investigation was made in her case, revealing definite histological changes in the cutaneous nerves. The hardening of the subcutaneous tissue in both cases attacked the face, neck, and the greater part of the trunk but spared the hands and feet.

Ortiz, P. N. LEPROSY. [Porto Rico Med. Assn. Bull., March, 1923.]

For the past eighteen months the new chaulmoogra oil esters supplied by the U. S. P. H. S. have been in use and forty lepers have been given this treatment. In seven cases because not well borne it had to be abandoned; nine patients have been notably improved, and eleven have shown slight improvement. In thirteen there was no effect. The benefit is most pronounced in the younger patients.

Teague, O., and Goodpasture, E. W. EXPERIMENTAL HERPES ZOSTER. [Jl. A. M. A., Vol. 81, August 4.]

The experiments reported here were carried out with the virus from a herpes lesion of the lip of a pneumonia patient. The virus was inoculated on the scarified cornea of a rabbit, and transferred at two or three day intervals to the cornea of a normal rabbit. The first rabbit inoculated February 7, 1923, died of a herpetic encephalitis, and the virus has continued since that time to cause a 100 per cent mortality among adult rabbits inoculated on the cornea. In these experiments, it appears that the herpes virus first multiplies at the site of inoculation in the skin and passes up the corresponding spinal nerve to its spinal ganglion; the virus then seems to pass centrifugally along the nerve and its branches to the skin, where, owing to the increased susceptibility produced by the application of tar, it multiplies rapidly and gives rise to characteristic herpetic vesicles. Another possibility is that the virus may travel from the site of inoculation to the main nerve trunk and then centrifugally along other branches of the nerve without first reaching and multiplying in the spinal ganglion. The authors feel certain that the secondary vesicles did not arise through accidental contamination of the surface of the skin with the virus, or through transfer of the virus by way of the lymphatic vessels of the skin and subcutaneous tissue, or by way of the blood stream. The distribution of the vesicles forces the conclusion that the virus passes along the course of the nerves to the skin, as in herpes zoster in man. It is suggested that the method of applying coal-tar to the skin of experimental animals as a preliminary procedure to the inoculation may render it possible to transfer to the lower animals some of the skin diseases of man of unknown etiology.

Wilson, G. CRURAL MONOPLÉGIA AND PARAPLEGIA OF CORTICAL ORIGIN. CORTICAL CENTERS FOR RECTUM, BLADDER, AND SEXUAL FUNCTIONS. [Am. Arch. Neur. & Psy., Vol. 10, December.]

Crural monoplegia due to a limited vascular lesion in two cases affords the basis of this study. The artery involved was the anterior cerebral supplying the upper part of the motor cortex along the intercerebral fissure extending from the frontal to the occipital lobe. On the mesial aspect from the frontal to the precuneus. Two other cases cited are instances of paralysis of both lower extremities with incontinence of urine and feces, and in one case paralysis of the sexual functions existed due to bilateral lesions.

Udoando, C. Bonorius and Carulla, J. E. EMETIN POLYNEURITIS. [Rev. Asoc. Méd. Argentina, Oct., 1923.]

Polyneuritis here developed in two instances at the second and third series of injections of emetin administered for amebic dysentery. The interval between the injections had been six months and a year respectively, but the polyneuritis is ascribed to cumulative action from the drug notwithstanding this long interval. Ambard's coefficient changes showed defective functioning, so that the elimination could not properly proceed.

Nagayo, Mataro. BERIBERI AND RICE NEURITIS. [Journal A. M. A., Vol. 81, Oct. 27.]

The author does not believe that it is warranted to consider beriberi as identical with the avitaminosis or hypovitaminosis of animals. It is appropriate, however, to consider the rice disease as an avitaminosis, because of the fact that in the animal suffering from rice disease, the amount of vitamin B contained in the tissue and organs is remarkably diminished as compared with the normal state. In beriberi no decrease of vitamin is noticed. A condition similar to experimental rice disease exists also in human beings. It is a peculiar form of farinaceous malnutrition (*Mehlnährschaden*), and may occur in badly nourished infants of the poor, who are continually fed with solutions of polished rice powder. The Japanese term it Chichiko dyspepsia. The findings in the organs coincide in every respect with those of rice disease, showing wasting, anemia, siderosis, atrophy of lymphatic apparatus and thymus, and other conditions. The recently discussed alimentary anemia, Nagayo thinks, is presumably the same as Chichiko dyspepsia.

Rivalier, E. ETIOLOGY OF HERPES. [Paris Méd., Vol. 56, March 17.]

Herpes is a recurrent disease in man and there is no effective immunization. In rabbits, however, experimental keratitis from inoculation with human virus is followed by permanent local immunity, and is followed by general immunity if an encephalitis develops. Heretofore

a keratogenetic virus in herpes zoster vesicles has not been demonstrated. Analogy between the virus of herpes and that of epidemic encephalitis is shown in descriptions of herpetic encephalitis in rabbits, and also by experimental epidemic encephalitis.

Laffont, A., and Gaujoux, E. OBSTETRICAL SEQUELS OF INFANTILE PARALYSIS. [*Gynecol. et Obstét.*, VII, 510.]

Thirty-seven patients suffering from long-standing anterior poliomyelitis with deformity of one or both lower limbs, constitute the material of this study from which the following formulations are recorded: If the disease has led to lameness of one or both legs, in the absence of atrophic changes in the bony pelvis, any consequent pelvic deformity interferes to a very slight extent with the mechanism or prognosis of labor; among twelve patients in this group twenty-five labors terminated normally at term. Lameness of one leg, when productive of pelvic deformity, leads as a rule to flattening on the opposite side of the pelvis. In patients showing, in addition to pelvic deformity (mechanically consequent on lameness), definite atrophic changes in the pelvic bones of one or both sides, pregnancy and labor call for very careful supervision. Both maternal and fetal prognosis are good (no maternal deaths are recorded, and only two stillbirths in the labors of fourteen patients); but only five spontaneous deliveries have been noted, and premature induction of labor, forceps delivery, or more rarely Caesarean operation, have been required in the majority of cases. In a third group of patients there is a combination of atrophy of the bony pelvis on the paralyzed side with pelvic flattening (due to excess of pressure) on the sound side. In this last group the adverse effect on the mechanism of labor is the most considerable; only one spontaneous delivery at term is recorded, and indications for Caesarean section are relatively numerous.

Boorstein, Samuel W. OBSTETRIC BRACHIAL PARALYSIS (ERB'S PALSY). [*Journal A. M. A.*, Vol. 82, March 15.]

This author concludes that obstetric brachial paralysis is due to stretching or tearing of the cervical roots of the brachial plexus. It is almost always associated with a difficult labor; in many instances, forceps having been used. The condition occurs in boys as frequently as in girls. The right side is more affected than the left. Affection of both arms is very infrequent. The upper arm type is due to injury of the suprascapular, and fifth and sixth cervical nerves. It is much more frequent than the lower arm type. The whole or lower arm type is due to injury of the entire plexus. Vertex presentation shows the larger percentage of occurrences of both types of cases. Improper management of the shoulder is responsible for many cases; hence they may be prevented by the obstetrician. If these cases are treated early and properly, one may expect in the mild cases a good recovery in three or four months. The more

severe cases will require about six or seven months for a complete recovery. Nerve operations are indicated if no advance is made in four months. After that period, if sufficient improvement is noticed one may wait four months more, provided, of course, proper orthopedic treatments are continued. The shoulder should immediately be put up in a splint or brace to prevent stretching of the paralyzed muscles and contracture of the unopposed muscles. The support must be kept up for a very long time, eight or nine months, as deformities may occur. Of course, massage and exercise are begun early. Even in the whole or the lower type, one may try conservative treatments for a while and then resort to a plexus operation. The result is not so discouraging as some textbooks would lead us to believe. The deformity at the shoulder, viz., the abduction and internal rotation, can easily be corrected by a tenotomy. The pronation of the forearm can be corrected by a muscle transplantation. A patient suffering from this affection should be under proper observation at least till the age of ten years, as slight deformity may present itself.

III. SYMBOLIC NEUROLOGY.

2. EPILEPSIES.

Hunt, J. R. A TYPE OF EPILEPTIC ATTACK CHARACTERIZED BY SUDDEN LOSS OF CONTROL OF POSTURE. [*Revue Neurologique* An. 31, T. II, No. 3, p. 201.]

This type of epileptic attack is characterized by a sudden loss of postural control so that the patient falls suddenly and violently. They are accompanied by a transient loss of consciousness but no convulsion. These static attacks are in relation to a disorder of the system of central static control. [Camp, Ann Arbor.]

Suttel, G., and Arsac, A. RESEARCH ON SOME PROPERTIES OF THE SERA OF EPILEPTICS. [*Revue Neurologique* An. 31, T. II, No. 2, p. 165.]

The author states that there is something in the blood serum of an epileptic that is favorable to the cicatrization of wounds and after determining the innocuousness of the serum by injection in guinea pigs, he used the serum by subcutaneous injection to assist in the healing of a varicose ulcer on the leg of a man aged fifty-five years. [Camp, Ann Arbor.]

Fraenkel, N. ROENTGENOTHERAPY IN EPILEPSY AND IN MIGRAINE. [*Zent. f. Gyn.*, Vol. 48, September 13.]

Fraenkel cites several cases of epilepsy, connected with menstruation, which were treated successfully with roentgen rays, and reports two others personally observed. One patient recovered after five irradiations, and no seizure was manifest as late as two and a half months; another received ten irradiations, with no recurrence of seizures noted up to six

months. The results from roengenotherapy were also encouraging in three instances of migraine, which usually appeared before, during or after the menses. Five and eight, and in one case a single irradiation, sufficed to banish the migraine. After four months one irradiation was employed in two patients, for certain precursor symptoms of migraine.

Shaw, E. B., and Moriarty, M. HYPOGLYCAEMIA AND ACIDOSIS IN FASTING CHILDREN WITH IDIOPATHIC EPILEPSY. [Am. J. Dis. Child., XXVIII, 553. Med. Sc.]

The authors have investigated what appear to be five typical cases of idiopathic epilepsy. These children were subjected to a period of fasting of ten to fourteen days. During this period they were given nothing but water in large quantities. The blood uric acid was noted to increase greatly during the fasting period. During the early period of fasting the blood-sugar fell rapidly and there was a development of an acidosis as shown by the presence of acetone and ketone acids. Later the blood-sugar tended to become normal and the acidosis passed off. The authors suggest that the diminution of blood-sugar indicates the greater ease of depletion of carbohydrate stores in childhood and helps to explain the increased tendency to acidosis. During the period of starvation two of the children whose blood-sugar had reached as low a point as 38 mgm. per cent had violent vomiting, but this was quickly got under control by the administration of sugar.

Hermann, G. EPILEPTIC SEIZURES. [Med. Klinik, Vol. 20, November.]

Two borderline cases are here discussed. The first patient was of interest because the seizure could be provoked by manipulation of the limb in which an aura was present. [Charcot erogenous zone.]

Pötzl and Schloffer. THE BRAIN IN THE EPILEPTIC SEIZURE. [Med. Klinik, Vol. 20, September.]

Pötzl and Schloffer observed a local edema of the surface of the brain coincident with a seizure during the operation for Jacksonian epilepsy. They produced similar changes in a dog by faradic stimulation of the brain cortex.

McNeil, C. FACIAL IRRITABILITY: ITS RELATION TO CONVULSIVE DISORDERS AND ITS GENERAL CLINICAL SIGNIFICANCE IN INFANCY AND IN LATER CHILDHOOD. [Edinb. M. J., XXXI, 651. Med. Sc.]

The author thinks that the clinical significance of facial irritability is very different in infancy and in later childhood. In infancy it is definitely associated with the convulsive disorders known as spasmophilia, and including laryngismus, general convulsions, and tetany. At this period of life facial irritability indicates that spasmophilic convulsions have recently occurred and may occur in the future. The likelihood of return of active spasmophilia may be judged by the severity of the facial

reaction and by the degree of muscular atony present. In the majority of cases of spasmophilia bony rickets is also present. The severity of the bony lesions of rickets is an unreliable guide to the dangers of active spasmophilia. In one-half of 56 cases of bony rickets facial irritability was absent.

In later childhood there is no apparent association of facial irritability with general convulsions, nor with asthma. The great majority of cases of general convulsions at this period occur without increased irritability of the peripheral nerves to mechanical stimulation. At this period facial irritability does not indicate that general convulsions have occurred, nor does it indicate a neuropathic constitution, nor any recognized functional or organic disorder of the nervous system. In most cases of older children the sign has no definite pathological significance, but it is met with most frequently in cases of disordered digestion. The frequent occurrence of facial irritability in cases of coeliac disease suggests that in conditions of chronic dyspepsia it may be the result of disordered calcium metabolism. Its still more frequent occurrence in cases of rickets complicated with spasmophilia may also be due to disordered calcium metabolism. [D. Paterson.]

Roussy, G., and Levy, Miss G. BILATERAL ACQUIRED ATHETOSIS WITH JACKSONIAN EPILEPTIC ATTACKS. [Revue Neurologique An. 31, T. I, No. 1, p. 88.]

A patient twenty years old began having a bilateral athetosis at the age of eleven. At about the same time she began having Jacksonian epileptic attacks usually ushered in by visual aura. The examination of the patient showed in addition to the athetosis, an explosive, scanning speech, increased tendon reflexes, lost abdominal reflexes and a bilateral Babinski reflex. The Wassermann test was negative on the blood and spinal fluid. [Camp, Ann Arbor.]

Guillain, G. JACKSONIAN EPILEPSY EXPERIMENT. [Bull. Soc. Méd. Hôp., Vol. 49, March 6.]

Adopting the technique of Rosset localized convulsions were brought about by Guillain, Alajouanine and Thévenard. These spasms resembled those in the patient's spontaneous spasms. The tetanic state occurred after six minutes of hyperpnea, with seventeen respirations to the minute. They emphasize the diagnostic value of the test, as the localization of the manifestations induced may help in determining the seat of the lesion for operation.

Bertrand, I., and Rives, J. ANATOMIC RESEARCHES ON SO-CALLED ESSENTIAL EPILEPSY. [Revue Neurologique An. 31, T. I, No. 2, p. 129.]

The author finds some change in the cortical architecture in the six cases that he studied and believes that these may be related to the epilepsy. [Camp, Ann Arbor.]

Stiefler, G. SYMPTOMATOLOGY OF EPILEPTIC SEIZURE. [Münch. med. Woch., Vol. 72, February 27. J. A. M. A.]

Stiefler deals chiefly with the diagnostic significance of C. Mayer's finger-thumb reflex. Strong passive flexion of the basal phalanx of a finger (with the hand supinated) causes in 96.5 per cent of healthy subjects an opposition movement of the metacarpus of the thumb, with flexion of its basal and extension of the second phalanx. The reflex center is in the nuclei supplying the small muscles of the thumb. This sign is practically always absent during epileptic seizures, including petit mal of longer duration, and is invaluable in epileptic twilight states. He confirms the possibility of provoking an attack by tachypnea.

Cohen, M. B., and Lichtig, H. A. PROTEIN SENSITIZATION AND EPILEPSY. [Ohio State Med. Jl., September, 1924. J. A. M. A.]

Ten patients with epilepsy, tested by Cohen and Lichtig to 128 proteins, showed no reaction which could be correlated with the convulsive seizures. It is generally agreed that the tendency to development of anaphylaxis is inherited and in cases of asthma and hay-fever there is a family history of similar conditions in from 30 to 40 per cent of cases. Careful inquiry into the history of these ten cases showed no larger percentage than that found among normal individuals, and conversely, in an analysis of 250 cases of asthma seen by one of the authors, there was no increase in the history of epilepsy in the family. In their opinion, protein sensitization bears little, if any, relation to the etiology of epilepsy.

Wagner, A. SYMPATHECTOMY FOR EPILEPSY. [Zent. f. Chir., March 21, Vol. 52.]

In this paper the author alludes to a case recently reported by Witzel of epileptiform convulsions following a gunshot wound of the motor area in which periarterial neurectomy of the carotid gland and extirpation of the superior cervical ganglion were performed. No further attacks occurred, but Wagner does not know whether this good result was permanent. He now reports a case in which he performed this operation for essential epilepsy on a woman, aged sixty-five, who for the last twenty-five years had undergone every possible treatment without effect. The attacks at first became decidedly fewer and the mental condition improved for about three months. The attacks then became frequent again and progressive mental deterioration occurred. Microscopical examination of the superior cervical ganglion showed a remarkable pigmentation of the ganglion cells, but no inflammatory or degenerative changes. The initial improvement in this case induced Wagner to perform the operation on another woman, aged twenty-four, whose attacks of epilepsy were much less severe. No appreciable change, however, resulted. Microscopical examination of the superior cervical ganglion in this case also showed an abnormal pigmentation of the ganglion cells. The author

remarks that it would be interesting to learn, if this pigmentation of the superior cervical ganglion is a typical lesion of epilepsy, what is its significance.

Lord, J. R. EPILEPSY: FIFTY CASES. [*Jl. Ment. Science*, Vol. 71, April, J. A. M. A.]

Lord says that a study of the epileptic seizure persuades one that it is symptomatic of a great brain storm in which all or nearly all parts of the brain are involved. These seizures occur typically in idiopathic cases. Storms of a very similar nature also occur in coarse lesions and other forms of epilepsy. Epileptic seizures are the manifestations of a cerebral explosion more as regards organized brain function, inherited and acquired, than a mere chaotic and haphazard explosion of cerebral matter. The neurons would appear to be associated during an epileptic fit as in the normal state. This, in Lord's opinion, is the most distinguishing feature of a true epilepsy as compared with Jacksonian attacks, whose progression of symptoms is merely anatomic. In the former there remains the indissoluble union between the motor, sensory and mental functioning of the brain, making an epileptic a risky, if not a dangerous, member of society.

Rodhe, E. LUMINAL TREATMENT OF EPILEPSY. [*Acta Med. Scand.*, 1923. *Med. Sc.*]

Rodhe reviews the history of the use of luminal phenylethyl barbitone in the treatment of epilepsy. It was originally used as an hypnotic in 1911 and was found useful in the treatment of epilepsy by Hauptmann the following year. His dosage was about 2 to 6 grains daily.

Since then luminal has been used widely, and Rodhe reviews a large literature dealing with the subject. In general the reports are favorable, especially in subjects with typical attacks of grand mal. In cases with petit mal the results were less favorable. Many of the authors regard luminal as superior to bromides in a large proportion of cases. There seems to be no serious drawback to its continued use over many years and, as with bromides, there is no need for an increase of dosage. Cases with an idiosyncrasy for the drug do not seem to be very frequent, but in these patients the results are various. Diarrhoea, apathy, muscular weakness, giddiness, incoördination, and a generalized body rash may all occur. Rodhe has himself used it since 1914 in doses of from 2 to 8 grains daily. He finds little difference between luminal and sodium luminal, and generally gives them in small doses several times a day. Cases of idiosyncrasy or inability to take the drug over long periods without bad results were very uncommon. He agrees with the general experience quoted above and finds that a small proportion of cases appear to be controlled, though it is always difficult to be sure if this is the result of treatment. Luminal and bromides combined can often be given in smaller doses than either alone, and he finds that luminal and calcium bromide

are specially effective in cases of petit mal. A few detailed case histories are given and a good summary of the literature.

Block, E. Bates. THE RELATION OF ADHERENT PREPUCE TO EPILEPSY. [Journal Med. Assoc. of Georgia, Vol. XIII, p. 473.]

A statistical study of 500 cases of epilepsy showed the presence of adherent prepuce in 55 cases. Of these 38 were males and 17 females. These figures do not include cases in which circumcision had been performed, some of which may have been done on account of adherent prepuce, and others for phimosis or sanitary reasons. There were a considerable number of cases of phimosis in the records which were not included as the prepuce could not be retracted and the presence or absence of adhesions could not be determined. An analysis of the other possible causes of the epilepsy in the 55 cases is presented. The author is inclined to adhere to the statement of Hippocrates that "the etiology and pathology of epilepsy are in the brain," but is not in a position to deny the possibility of a summation of stimuli. As we have no definite statements in the literature as to the frequency of adherent prepuce in general, the author feels that the only conclusion that can be drawn from this work is to state that the frequency of adherent prepuce in epilepsy is 11 per cent. [Author's abstract.]

Messing, S. NYSTAGMOID EQUIVALENTS IN EPILEPSY. [Encephale, Vol. 19, December. J. A. M. A.]

Messing treated a young epileptic girl, with seizures of both grand and petit mal type, also with frequent attacks of movements of the eye-balls resembling nystagmus, as epileptic equivalents. He assumes that the eye movements were caused by irritation of the lateral oculomotor center, situated in the eleventh convolution of the left hemisphere. The factor of irritation may be a postinflammatory scar in the meninges from some infectious disease in childhood. Intracranial insufflation exerted a favorable effect. The seizures became less frequent and shorter, with less impairment of consciousness; headaches disappeared, and the memory improved. The third insufflation had been made at the request of the patient.

Talbot, P. B., Hendry, M., and Moriarty, M. THE BASAL METABOLISM OF CHILDREN WITH IDIOPATHIC EPILEPSY. [Am. J. Dis. Child., XXVIII, 419. Med. Sc.]

This paper describes a series of articles of basal metabolism in eleven epileptic children with normal physical development. Reports have appeared in the literature from time to time of the value of thyroid extracts in epilepsy. The results of the basal metabolism investigations in this series of cases were normal or elevated, and this is interpreted to mean that thyroid gland medication is not indicated in the treatment of these children. These basal metabolism findings are in keeping with

those of Boothby, who found that in 79 per cent of twenty-four cases studied, the metabolism was also normal or elevated.

Miller, J. L. IDIOPATHIC EPILEPSY A SENSITIZATION DISEASE. [Am. Jl. Med. Sciences, Vol. 167, November.]

One of the "protein sensitization" papers in which after a series of tests in migraine with some results said to be positive, similar types of reasoning adduce that idopathic epilepsy is a protein sensitization disorder.

Fox, J. Tylor. THE RESPONSE OF EPILEPTIC CHILDREN TO MENTAL AND EDUCATIONAL TESTS. [The British Journal of Medical Psychology. Vol. IV. Part 3, p. 235.]

In this paper the inherent difficulties in the application of these tests to epileptics are frankly admitted and discussed. In the first place, there is the variation of response obtained from day to day, or from week to week, in the same patient, a variation that may be definitely associated with the occurrence of fits, or may be dependent on emotional change quite apart from fits. Although, in the latter case, it is the temperament, rather than the intelligence, which is primarily affected, the response to tests, designed to test native intelligence or educational attainment, may be profoundly influenced by temperamental change. But, beyond this, many epileptics show, even during their school career, a progressive deterioration. Such a deterioration is, indeed, a characteristic of the disease. In some cases it becomes manifest early, in others it is long delayed; in some cases it is rapid, in others very slow; in some its progress is regular, in others erratic. Often, but not always, it has a pretty obvious relation to the fit incidence. The mental progress of an epileptic child is the resultant of two forces. On the one hand there is the forward push towards mental development that he shares in common with all growing things; on the other there is the retardation due to the complaint. The latter form is often a variable one, and the progress of the epileptic child therefore irregular. Wide variations in the mental ratio may be found from year to year, and the presence of such variations will obviously lessen the value of statistical results of mental tests on epileptic children studied in bulk. Further drawbacks to such study are found in the extraordinary diversity of the etiological factors in the "disease" we call epilepsy, the wide range of its symptoms, and the uncertainty of its course.

After these preliminary considerations, the paper goes on to record and discuss the results obtained by the application of three general intelligence tests, and eleven tests of scholastic attainment to 150 children attending a residential school at the Lingfield Colony for Epileptics, England. The median mental ratio in the Binet-Simon series of tests is found to be 71 for boys and 65 for girls. The tests are rearranged in their order of difficulty for epileptics, and the new order is found to approximate pretty closely to that determined by Dr. Binet among

mentally deficient children. The Porteus Maze tests receive a good deal of consideration, and their claim to measure "Social Efficiency" is investigated. Owing to the opportunity for the continuous observation of children over long periods, it was felt that those in charge of the children's homes would be able to provide a fairly accurate check on any "Social Efficiency" measurement. By them the children were allocated into four groups, in accordance with their answers to the following questions:

- Supposing this child never had any more fits and continued to attend school, into which of the following groups would he fall at the age of 16?
- A. Able to earn his own living under ordinary conditions, and manage his own affairs.
 - B. Not so good as A. but able to live outside an institution and make a fair contribution, under favorable conditions to his own support.
 - C. Requiring institutional treatment; but could do useful work in an institution.
 - D. Requiring permanent institutional treatment, and unable to render any useful service.

(In answering this question, no account to be taken of physical defects, *e.g.*, paralysis.)

An endeavor was then made to correlate the individuals in these four groups with their mental ratios as obtained by the maze tests by Burt's tests for reasoning power, and by the Binet-Simon tests. The results are striking, and show that the maze tests are a poor guide to social efficiency, the reasoning tests are somewhat better, while the Binet tests are surprisingly accurate. (There is ample room for further investigation here. Social efficiency is, after all, what, from the point of view of the community, we want to measure. The measurement of intelligence will, no doubt, give us a good guide, but temperamental abnormalities are a greater social handicap to epileptics than defects of intelligence.)

The method of applying the various educational tests is described, and certain general conclusions arrived at. Boys are found to be generally superior to girls, especially in arithmetic, and tests where reasoning is required. The only test in which girls excel is a mechanical one. Tests for general intelligence give better results than educational tests. This, no doubt, is partly due to the fact that many of the children, before admission to Lingfield, had had long periods without attendance at school, and partly to the fact that the education at Lingfield does not follow normal elementary lines. Failure is especially apparent in tests where recent memory, concentration, reasoning, and the use of written language are concerned.

Further investigation among a still larger number of children is required to compare the response of groups of patients, classified accord-

ing to the etiological factors, or to the clinical manifestations of the disease. [Author's abstract.]

Juarros, C. TREATMENT OF EPILEPSY. [Siglo Médico, Nov. 1, 1924. J. A. M. A.]

Juarros declares that there is no symptom of any kind that stamps a convulsion as true epilepsy; he restricts the term to seizures on a basis of a characteristic mental state. All others are reflex pseudo-epilepsy, and when it is possible to discover and eliminate the primary condition starting the reflex, we may obtain surprising cures of apparently inveterate epilepsy. He cites instances of recovery after removal of a turbinate bone or adenoids, reducing glycosuria in a diabetic, modifying a congested liver, dropping tobacco, or regulating digestive functions. Reduction of intake of salt has improved many cases even without sedatives, but he usually gives bromid or phenobarbital with this and a predominantly milk-vegetable diet, insisting on a quiet mode of life, free from care but not idle. In 343 cases treated with bromid (5 to 10 gm.) no effect was apparent in 29, and the mental condition was not modified in any instance, but in 2 the seizures did not recur and in 125 the seizures were reduced by 50 per cent; in 97 they were reduced, but to a lesser extent. In 214 cases treated by 0.10 to 0.30 gm. of phenobarbital, the seizures did not return, after dropping the drug, in 35 and in 120 they did not recur when the drug was kept up. In 40 cases the seizures were reduced by more than 50 per cent and there were only two cases in which no effect was apparent.

McCready, E. Bosworth and Ray, Henry M. ALLERGY AS A FACTOR IN THE ETIOLOGY OF IDIOPATHIC EPILEPSY. [Med. Jl. and Record, Vol. 120, October 15.]

After centuries of study the explanation of the convulsive phenomena making up the symptom complex commonly designated as idiopathic epilepsy remains unsatisfactory and uncertain. It has seemed to the writers that a phenomenon so constant in its character must have a fairly constant etiological basis, however diversified the antecedent factors may have been. Recent investigations of the phenomena of anaphylaxis have cleared up many problems in hitherto obscure and diverse conditions. It is not surprising when it was observed that convulsions are very often a manifestation of anaphylactic shock that epilepsy should be included among the conditions in which allergy is a possible important etiological factor. Dietetic indiscretions have long been notorious in the causation of convulsions, heretofore attributed to gastro-intestinal irritation rather than to specific hypersensitiveness. A study of cases reported in the literature both current and remote and of the anamnesis of personal cases show an apparent frequent relationship between initial and individual attacks and the introduction of a foreign protein into the economy as food, sting of insect, serum, etc. The writers, as a result of their studies and of clinical investigation believe that it is reasonable to postulate an

intimate connection between the phenomena of anaphylaxis and allergy and those of idiopathic epilepsy. Proof requires further investigation in many fields. They quote the observations of Novy and De Kruif upon the subject of anaphylaxis which they believe are pertinent to their hypothesis as follows: "It is important to realize from the medical viewpoint that inducing substances may develop within the normal animal through some unrecognized cause which may lie in a peculiarity of diet, or in exposure, or in obscure infections, etc. As a result, the blood of such an animal will be abnormally toxic because of the presence of anaphylatoxin or taraxin. This condition has actually been observed in normal untreated rabbits. A similar condition is without doubt of frequent occurrence in man and while the amount of poison thus produced may not be sufficient to cause an acute anaphylactic or taraxic shock, it may lead to a subacute or chronic form of intoxication. The sudden formation of much anaphylatoxin or taraxin may bring on the explosive effects seen in eclampsia, and perhaps in surgical shock, not to mention other attacks with rapid onset. The gradual production and presence of such poison may result in the obscure effects noted in connection with some of the so-called autointoxications, and it may lead to anemia, cachexia, etc. Lastly and not the least, it is also to be remembered that a considerable part of the toxic effects in infectious diseases is in all probability due to the formation of anaphylatoxin or taraxin. In other words, infection leads to taraxy. The great and far reaching importance attaching to this problem will be evident the moment it is realized that the circulating blood, through a variety of agents, may be changed from a beneficial and harmless to an injurious and poisonous state. The alien substance is merely the trigger which, so to speak, ignites or explodes the charge contained within the blood vessels." Why an anaphylactic shock should eventuate in convulsions instead of the more usual phenomena offers fertile field for speculation. Perhaps a predisposition to convulsions exists because of inherent organic inferiority of the cerebral cortex. Perhaps certain protein split products possess a specificity for certain cells, in which case convulsive crises may occur rather than bronchial, gastric or other more usual manifestations. The resulting nerve cell pathology or nerve cell irritability may then constitute the foundation for subsequent convulsive crises either with or without an anaphylactic basis. Nonspecific protein shock therapy has been utilized in various forms with results comparing very favorably with other methods of treatment. However, in the present state of our knowledge radical measures based upon the assumptions mentioned above must be avoided, for the state of the epileptic is pitiable enough without incurring the danger of rendering it worse by injudicious therapeutic activity. If an offending protein or other substance is apprehended it should be removed from the diet or from the environment of the individual. In addition the immunity threshold should be raised by every possible means medical, hygienic and educational. [Author's abstract.]

BOOK REVIEWS

Fuchs, Alfred. EINFÜHRUNG IN DAS STUDIUM DER NERVENKRANKHEITEN FÜR STUDIERENDE UND AERZTE. Zweite umgearbeitete und vermehrte Auflage. [Franz Deuticke, Leipzig u. Wien.]

It is many years since the first edition of this introduction was published. Now it reappears in greatly enlarged and rewritten form.

It is difficult to appraise this work. It is scholarly but sketchy, suggestive as an introduction should be, but sometimes quite fragmentary.

On the whole, it is a book to be known although it is not to be considered either as a manual or a textbook.

Mackenzie, Wm. Colin. INTELLECTUAL DEVELOPMENT AND THE ERECT POSTURE. [Allan Grant, Melbourne.]

Dr. Mackenzie is the Director of the National Museum of Australian Zoölogy. This is a short but direct essay chiefly devoted to saying that if there were better muscular efficiency in life there would be less chronic disease.

Very entertainingly the lessons taught by the Australian fauna are reviewed from the aspect of development of the erect posture and its attendant brain evolution, a thesis known to all, but here well illuminated from an unaccustomed angle.

Australia, as the land of living fossils, has much to contribute to the phyletic history of animal evolution and the story is here most fascinatingly unrolled.

Browning, William. "MEDICAL HEREDITY," DISTINGUISHED CHILDREN OF PHYSICIANS. United States to 1910. [The Norman, Remington Company, Baltimore. \$4.00.]

This work is unique and interesting. Woods some years ago gave us a work on heredity and royalty, Galton before him a vastly important study on genius and heredity and many studies have confined themselves to pathological factors. Here the author has listed in a book of 250 pages the distinguished children of physicians. There are some 6,500 names recorded and certain deductions are drawn relative to the effect that medical interests on the part of the parents may have upon the lives of their children.

Dr. Browning is to be congratulated upon his industry, for this compilation must have consumed an enormous amount of time and untiring devotion. Furthermore, he has given us something which will prove of great value. The book deserves a wide recognition and appreciation.

MacCurdy, George Grant. HUMAN ORIGINS. A MANUAL OF PREHISTORY. [D. Appleton and Co., New York and London.]

Physicians more than any other members of the community should be interested in and conversant with the history of man, his origins, his habits, his structures and his functions. Anthropology and ethnology are back drops in this stage setting and in the volume before us we have one of the best of these settings which has appeared in the last ten years. While a little more technical than Osborne's *Men of the Old Stone Age*, yet it is equally delightful reading and besides offers the interested student plenty of material for further reading or research.

Such a work is indispensable for anyone who would pretend to know anything about man's early history and how we came to be.

Monrad-Krohn, G. H. TECHNIQUE CLINIQUE D' EXAMEN COMPLET DU SYSTÈME NERVEUX. [Librairie E. Le Francois, Paris.]

This is a French edition of the second edition of Monrad-Krohn's excellent manual edited and augmented by Dr. R. Mourgue. We have had occasion to commend this work in its English dress; it has been considerably amplified and made more valuable by Dr. Mourgue.

Kerr, James. SCHOOL VISION AND THE MYOPIC SCHOLAR. [George Allen and Unwin, Ltd., London.]

A very readable small book chiefly devoted to myopia as seen in school children and pedagogic means of correcting or ameliorating the condition.

The rapid increment in myopia in the pubertal years is quite insufficiently discussed inasmuch as the author has given no inkling of psychological factors in the production of this great increase in these years.

Crofton, W. M. AN OUTLINE OF ENDOCRINOLOGY. [William Wood and Company, New York. \$2.25.]

This is a short, comprehensive and at the same time common sense outline of endocrinological principles prepared for medical students and practitioners. It is conservative and a bit didactic and only hormonal factors are stressed. That the endocrines are a part and parcel of the vegetative nervous system is not sufficiently discussed.

Jarkowski, J. "KINÉSIE PARADOXALE" DES PARKINSONIENS. [Masson et Cie, Editeurs, Paris.]

Dr. Jarkowski has been one of Babinski's most devoted associates and this carefully worked out study on the mechanisms of voluntary motion is dedicated to the master as coming from his clinic at La Pitié.

The post-encephalitic motility disturbances have afforded here as elsewhere a number of situations which previous hypotheses concerning the motor activities have failed to solve.

The chief deduction arrived at here is that the so-called parkinsonian disturbances consist chiefly in an enfeeblement of the impulse to action resulting from a diminution of the "protoenergetic" reactions which are a part of the affective motility. Thus the respective issues of extrapyramidal and pyramidal activities are brought into relief.

While the analysis is not as profound as may be found in the classical studies of Lewy, Jacob, Magnus, Wilson, Wimmer, Walshe and others, nevertheless the monograph contains much of value.

Smith, G. Elliot. *THE EVOLUTION OF MAN. ESSAYS.* [Oxford University Press, New York, London, etc.]

This series of essays deals with some general questions of man's ancestry in a most delightful and intriguing manner.

He first plots out man's ancestry upon anthropological data and gives a brief summary of the evidence afforded by skulls and teeth and other structures of primate evolution from his favorite shrew-like animal *Tarsius*. The story of the wanderings of these early monkey tribes forms a brief introduction to his main theme, the evolution of man.

This first essay is a reprint of an old lecture which loses nothing in the retelling, especially as he leads us directly into those phases of evolution as shown in the development of the nervous system, and particularly in the formation of the neopallium and the later differentiations of this and further evolved structures from *Tarsius* onward. This brings him in a second essay to primitive man. Here again the developments most accented are those recorded in the brain structures, as deducible from skull structure. Anthropological and ethnological evidences are briefly and cogently presented.

Chapter III deals with the human brain in its evolutionary aspect as determined by the increase in the capacity of distance receptors, chiefly those of the optic apparatus.

We can but very briefly indicate a few of the outstanding features of this most interesting presentation.

Brandt, Alexander. *SEXUALITÄT. EINE BIOLOGISCHE STUDIE.* [Ernst Reinhardt, Munich. Mk. 5.]

There never has been a time in the history of man, so far as its records take us, when sexuality was not of interest and importance. It might even be asserted that the mechanisms through which it has expressed itself have been of extreme significance from the very beginning of life, for these mechanisms are life itself and without them that which has been termed evolution would not be understandable. As one turns over the pages in retrospect in Darwin's *Cross Fertilization in Plants*, one is impressed, in the lowest of forms even, with the ingenuity shown for regulating certain aspects of the sex mechanisms. Here one may even see the precursors of what has come to be called in human psychosexual terminology, exogamy and endogamy. Even the oedipus situation might, by way of implicitness, be rung into the mnemonic pattern.

But with these and allied questions the present volume does not

aspire to deal. Here the author would limit himself to biological phenomena promising to deal later with sociological matters. Thus he takes up the "vorstufe" of the sexual processes seen in lower organisms in the cell mingling of resting spores in algae and with the beginnings in this lowly plant group of certain gametes and the typical sexual activities of impregnation, etc. From here he goes into the phenomena in metazoa and then discusses the segregation, partial or complete, of the fertilizing elements in the sex cell.

This leads to the problems of impregnation of species, evolution and the origin of sexually differentiated organisms. The essential and secondary features are discussed and he finally concludes in Chapter IX on the male and female as a whole.

This small brochure of 172 pages is very carefully written, contains many suggestive and interesting points of view and is very instructive, readable and quite sound, so far as our own experience with the problems involved has taken us.

Kronfeld, Arthur. PSYCHOTHERAPIE, CHARAKTERLEHRE, PSYCHO-ANALYSE, HYPNOSE, PSYCHAGOGIK. [Julius Springer, Berlin.]

The first edition of this valuable contribution appeared in 1923. We reviewed it somewhat hectically in our January, 1925, issue (p. 103), pointing out in that place the imminent need of a rational psychotherapy, if society is to be protected from hokum legislation, hypocritical law manufacturing, and quack medicine. We said that Kronfeld's very impressive monograph was a step taken in the right direction.

This second edition, appearing two years later, alone by its prompt reception evidencing its acclaim, is of even greater value.

As the author points out in his preface, in the short interval of time measured between the two editions a great movement in medicine towards a better appraisal of psychotherapy has taken place. In other words, in every field of human endeavor the psychical or "soul" component of mankind is receiving more and more attention. Man as a unit, as a feeling craving, purposing whole, rather than as a pure intellectual bit of commercial machinery, is the keynote of this movement, and such is the push behind Kronfeld's second edition.

"In a thousand ways, behind a thousand masks and formulæ, one sees the present day effort to again find the 'soul' of mankind." This is the trend here accented as being fruitful for sound character formation and looking towards healthy individual as well as healthy social organization.

The work will be found of much interest for American readers in that the author is well oriented to most of the philosophical and psychiatric movements in Germany, though somewhat deficient in mirroring equally valuable and sound attitudes in other cultural lands. Apart from this myopic "nationalismus," a sort of intellectual snobbishness for things germanic, it has everything to commend it. Practically only a few foreign thinkers whose works have been trans-

lated into German are mentioned and these only as bibliographic appendages.

The book is full of meat, but the cuisine, so to speak, partakes a little of the "goulash" type of manner in preparation, and wholly lacks the fine mode of presentation of the French esprit. In a sense—and here we mean no offense—there is some of the American jazz in its overturgid presentation. It lacks entirely the careful English method, insular though that discipline has been.

In principle the work is Freudian, speaking in the most general terms. This is one of its most fundamental values. In detail, so far as the psychoanalytic detailed presentation is concerned, it is avowedly Adlerian. The author also shows a distinct leaning towards the value of hypnotic therapy. His argumentation is seductive but not by any means convincing. Anglo-Saxon repression mechanisms may be involved in this judgment, and possibly antisemitic factors play a contributory rôle, at all events this section of the book reads like a regression to the Charcot-Bernheim era, which argues more for a moron level of the proletariat than perhaps this, the United States, will be willing to recognize, in spite of the Menckiana of the American Mercury, unflattering as this appears in reality.

In short, Kronfeld's work offers an interesting and stimulating symposium, with a leit motiv with which we hold ourselves in reserve. Personal predilections may, yes it may be admitted they undoubtedly do, influence this judgment; thus in commending this volume most highly it must be read *cum grano salis*.

Schultz, I. H. GESUNDHEITSSCHÄDIGUNGEN NACH HYPNOSE. ERGEBNISSE EINER SAMMELFORSCHUNG. [Carl Marhold, Halle.]

Dedicated to Professor Binswanger, formerly professor at Jena, the author would here show that hypnosis is not always what some would believe it to be. This series of monographs founded by Alt, is now directed by Professor Bumke, formerly at Leipzig and now Kraepelin's successor at Munich. Although dated as of 1922 we are glad to review it.

In general it may be stated that the author here would show the disadvantages, yes, even the dangers of the hypnotic type of psychotherapy.

This small monograph shows quite conclusively that the "hypnotic" stage of psychotherapy is attended by marked dangers. The author circulated a questionnaire, herein explicitly described. The general conclusion to be drawn is that hypnosis has dangers which are incommensurate with its advantages. The inner psychic mechanisms which induced Freud to abandon hypnosis in favor of a more rational therapy are not touched upon, save by implication.

OBITUARY

DR. CARLOS FREDERICK MACDONALD

Dr. Carlos Frederick MacDonald, the well-known alienist, died at his residence in Central Valley, N. Y., May 29, 1926. Dr. MacDonald was born in Niles, Ohio, August 29, 1845, and was within two months of his eighty-first birthday at the time of his death. He was a grandson of Angus MacDonald, of the famous clan MacDonald, of Scotland, who came from Inverness, Scotland, in 1840 and settled in Newark, N. J.

At the age of sixteen, he enlisted in the Sixth Ohio Volunteer Cavalry, and served until the end of the war, being under fire in many famous battles.

Dr. MacDonald was graduated M.D. at Bellevue Hospital Medical College in 1869, and during part of 1869 and all of 1870 was assistant physician in the Kings County Hospital, and from 1871 to 1875 was assistant physician and resident physician to the Kings County Lunatic Asylum, now the Brooklyn State Hospital.

He was Medical Superintendent of the State Hospital for Insane Criminals, at Auburn, N. Y. (now the Matteawan State Hospital), with a slight intermission, from 1876 to 1889, when Governor Hill appointed him president of the newly created State Commission in Lunacy (now the State Hospital Commission) in which capacity he took an active part in securing State care for the dependent insane, and was largely responsible for the legislation which gave the death blow to county care of the insane in the State of New York.

In January, 1879, while Superintendent of the Auburn institution, he abolished the use of mechanical restraint in the management of insane patients, this being the first instance in this country of the absolute disuse of such restraint in a hospital for the insane.

Dr. MacDonald held many positions of honor and was Professor of Mental Diseases in Bellevue Hospital Medical College during 1887-98; and Professor of Mental Diseases and Medical Jurisprudence in the New York University and Bellevue Hospital Medical College from 1898 to 1906.

From 1906 to 1920 he was proprietor of "Dr. MacDonald's

House," a sanitarium for mental and nervous diseases in Central Valley, N. Y. He was a member of many medical societies and in 1914 was president of the American Psychiatric Association. He received the honorary degree of A.M. from Union College in 1894, and that of LL.D. from the New York University in 1917. He was probably best known as a medical expert and won a national reputation by having taken part in many celebrated trials. His efforts to ameliorate the conditions of the mentally afflicted crowned a successful life with well deserved triumph. [Chas. W. Pilgrim.]

CHARLES B. DUNLAP, A.B., A.M., M.D.

Dr. Charles B. Dunlap, Chief Associate in Neuropathology at the New York State Psychiatric Institute and Professor of Neuropathology at University and Bellevue Hospital Medical College, died at his home in Scarsdale, N. Y., on June 6, 1926. Although it was known that Dr. Dunlap had not been in good health for some time, it was not believed that his condition was serious. In fact, he was in his laboratory on Saturday at work as usual, but on Sunday morning he was seized with an anginal attack and passed away shortly after noon on that day.

Dr. Dunlap was born in Cambridge, Mass., August 24, 1863. His boyhood was spent in West Virginia which had been the home of his family for many years. He returned to Cambridge to complete his education in the high schools and later entered Harvard College, where he was graduated in 1889 with high honors, receiving both a Bachelor and a Master degree in Arts. He then began the study of medicine in the Harvard Medical School and received his M.D. in 1893. This was followed by an internship in the Boston City Hospital, following which he was appointed First Medical House Officer and in this capacity served several years. Upon finishing his general hospital experience, Dr. Dunlap began his training in neuropathology at the McLean Hospital laboratory where he worked with the late Dr. August Hoch. In 1899 he was appointed by Dr. Meyer as Assistant in Neuropathology at the Worcester State Hospital, and when Dr. Meyer came to Ward's Island in 1902 he invited Dr. Dunlap to take the position of Chief Associate in Neuropathology. In addition to his work at the Institute Dr. Dunlap subsequently became Instructor and finally Professor in Neuropathology in the University and Bellevue Hospital Medical College. He was a member of the New York Neurological Society and the American Psychiatric Association.

Dr. Dunlap's scientific contributions covered many important

problems in the field of neuropathology. He was among the first in this country to take up and confirm the important observations of Nissl and Alzheimer on syphilis of the central nervous system,



CHARLES B. DUNLAP, A.B., A.M., M.D.

on cerebral arteriosclerosis, and on senile brain atrophy. An important paper entitled "The Anatomical Borderline Between the So-called Syphilitic and Metasyphilitic Disorders of the Brain and Spinal Cord" was published in the American Journal of Insanity, No. 5, 1913. Another paper on this subject entitled "The Pathology

of General Paralysis" was published in the *American Journal of Insanity*, October, 1914. Following the appearance of the epidemic of encephalitis in 1918, Dr. Dunlap devoted considerable time to the study of this disease and contributed a paper entitled "Brain Changes in Lethargic Encephalitis" published in the *State Hospital Quarterly* for May, 1921.

For a number of years Dr. Dunlap spent a great deal of time on the pathology of Huntington's Chorea and made a number of preliminary communications on this subject. It is planned to publish at an early date a valuable manuscript which he left dealing with this subject.

Dr. Dunlap was for many years interested in the subject of the brain changes in dementia precox. While he did not deny the probability of a definite anatomical foundation for this type of mental disorder, he was not able to confirm the findings of others who claimed to have discovered characteristic lesions in the brain of cases of dementia precox. Dr. Dunlap showed that the reported changes could not be considered typical or specific for dementia precox. His last paper on this subject, entitled "Brain Changes in Schizophrenia," was read at the meeting of the Association for Research in Nervous and Mental Disease, December, 1925.

Dr. Dunlap was an outstanding figure in neuropathology in this country. His contributions, conclusions and opinions were highly valued and always respected. He was a most careful and conscientious worker and he always subjected his own formulations and conclusions to an even more critical analysis than he did the work of others. He possessed qualities of intellect and temperament which stamped him as a true scientist. His students and colleagues always found him kind, sympathetic and generous. He gave to them freely of his time and no effort was too great for him to make on behalf of anyone interested in a scientific problem. He was a man of simple tastes who disliked display and ostentation in any form. His students and associates recognized in him a teacher and investigator of unusual ability, one whose sincerity and devotion to duty and high scientific ideals were a constant stimulus and inspiration to all who came under his influence.

GEORGE H. KIRBY, M.D.

N. B.—All business communications should be made to *Journal of Nervous and Mental Disease*, 64 West 56th St., New York.

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ORIGINAL ARTICLES

BLADDER DISTURBANCES IN LESIONS OF THE NERVOUS SYSTEM*

By I. LEON MEYERS, M.D.,

ATTENDING NEUROLOGIST, LOS ANGELES GENERAL HOSPITAL, LOS ANGELES, CALIF.

The subject of bladder disturbances in lesions of the nervous system is in a state of much confusion.

The disturbances, which are, broadly speaking, of two types, retention of urine and incontinence of urine, form in many of these lesions and especially in lesions of the sacral cord, an early and dominant symptom. They are also of the utmost importance in the prognosis, constituting through the resulting infections of the urinary tract, an immediate menace to the patient's life. We are still ignorant, however, of the mechanism of their production. Thus in the case of retention of urine we do not know whether this is caused by failure of the expulsive powers of the bladder or by overaction of the sphincter, the same being true of incontinence of urine, in which case these factors would be operating in a reverse manner. Neither do we know of the rôle played by sensory disturbances in the production of these symptoms. For example in the case of tabes dorsalis we do not know whether the retention or the incontinence, either of which may occur in this disease, is brought about by a fault in the motor mechanism of the bladder, or by the sensory impairment so characteristic of this disease, as a result of which the patient fails to perceive the distention or evacuation of his bladder.

The bladder disturbances in the diseases of the nervous system consequently do not have the value in diagnosis they deserve.

* Read by invitation before the Western Branch of the American Urological Association at its Meeting in Yosemite Valley, California, May 20, 1925.

It is my object in this communication to report briefly my personal observation of these disturbances in a number of injuries and diseases of the spinal cord and to discuss their pathogenesis so far as our present knowledge of the anatomy and physiology of the organ warrants it.

THE NERVOUS ANATOMY OF THE BLADDER AND URETHRA

The bladder which, as an organ of micturition includes the proximal portion of the urethra, receives its nerve supply from three sources: (1) the central, (2) the sympathetic, (3) and the pelvic or autonomic nervous system. The nerve fibers arising in any one of these systems are of both types—efferent as well as afferent, the modality of sensation subserved by them, being characteristic of the system from which they are derived. The fibers of the central nervous system reach it by way of the internal pudic. This nerve, which originates in the second, third and fourth sacral segments of the spinal cord, forms the principal nerve to the skin and musculature of the perineum. It enters into the innervation of the bladder by a branch to the voluntary or external sphincter of the urethra and by sensory fibers to its mucous membrane. The fibers from the sympathetic nervous system originate in the third, fourth and fifth lumbar segments and passing through the ganglionated cord without interruption are continued down to the inferior mesenteric ganglia where they terminate. Here they arborize with new ganglion cells which form the immediate effector or motor cells of the sympathetic nervous system to the bladder, corresponding in this respect to the anterior horn cells, or motor cells of the central nervous system. Their fibers, passing down as the hypogastric nerves enter into the formation of the pelvic plexus, to be ultimately distributed to the internal, or involuntary sphincter of the bladder and the musculature of the trigone.(1) The bladder, finally, receives by way of the *nervi origines* innervation from the pelvic autonomic or parasympathetic nervous system. These nerves, like the internal pudic, have their origin in the second, third and fourth sacral segments. They ramify with the hypogastric nerves of the sympathetic, forming the pelvic plexus from which their fibers are continued to the bladder wall. Here they terminate at ganglion cells which, physiological evidence tends to show, are the effector cells for the musculature of the bladder, the so-called detrusor muscle, exerting their action on this muscle by way of short terminals to its fibers. The type of sensations subserved by the latter two systems is, it appears, that of tension in the bladder wall. The tension, depending upon the

degree to which the muscles fibers are stretched, reacts upon consciousness either as to discomfort or as a colicky pain, bringing about the expulsion of the urine.

MECHANISM OF THE NORMAL BLADDER FUNCTION

It has been shown experimentally by Budge,(2) Giannuzzi,(3) Langley and Anderson,(4) and more recently by Elliott,(5) and Barrington,(6) that the stimulation of the hypogastric (sympathetic nervous system) produces a contraction of the internal sphincter, while stimulation of the *nervi origines* (the pelvic autonomic) produces a contraction of the musculature of the bladder wall. It has been further shown by von Zeissl,(7) Langley and Anderson, and especially by Stewart (8) that the sympathetic produces simultaneously with the contraction of the sphincter a relaxation of the detrusor, while the pelvic autonomic, in addition to its effect on the detrusor, exercises an inhibitory effect upon the sphincter. The theory was thus formulated by von Zeissl, and is taught by Guyon, Gowers,(9) and others that the state of the bladder at rest as well as in action, is the resultant of mutually opposing forces exhibited, respectively, by the sympathetic and pelvic autonomic nervous system. The bladder they maintain, is at rest as long as the tension of its wall is moderate, in which case the action of the sympathetic is dominant. It, on the other hand, becomes active and expels its contents when the tension becomes excessive, such tension exerting a selective action upon the pelvic autonomic system allowing this system to gain the upper hand.

Another theory of the normal bladder action is that of Goltz.(10) This physiologist believed that normal micturition is essentially a voluntary act occurring in response to a conscious sensation from stimulation of the urethra. The bladder, according to his view, on becoming distended, forces out a few drops of urine into the proximal portion of the urethra, where by stimulating the mucosa, it brings about voluntary inhibition of the external sphincter allowing micturition to take place.

THE TYPES OF BLADDER DISTURBANCES THAT ARE MET WITH IN DISEASES OF THE NERVOUS SYSTEM

Retention of urine. This is a condition in which the bladder is incapable of expelling its contents and urine accumulates in it in a quantity far greater than the normal capacity of the organ (16 to 32 ozs.). The quantity of urine so accumulated may reach two quarts and even more. A variation of this disturbance is straining

at urination (dysuria). In this condition the patient exerts pressure on the bladder by the contraction of the diaphragm and the abdominal muscles. The amount of urine expelled in this manner is, however, small. Dr. Eshman of the General Hospital, who measured the residual urine for me in a number of cases of retention in *tabes dorsalis* following urination by straining, found it in some instances to be as much as 1,500 c.c. The continuous state of distention of the bladder causes the patient, in case the sensation of the bladder is unaffected by the lesion, continuous discomfort bringing about frequency of urination. Associated with the retention there may or may not be an incontinence of overflow. Such incontinence, if present, manifests itself by irregular escape of small quantities of urine always leaving, however, the bladder distended. Retention of urine, with or without incontinence of overflow, is the primary disturbance of bladder function which occurs in any injury of the cord, regardless of the segment injured, whenever the injury is of sufficient severity to affect the function of micturition.

I had the opportunity to observe within the last sixteen months nine cases of complete physiological interruption of the cord as a result of trauma. The lesions involved the cord at the following levels: Three at C 6-7; one at D 10-11; three at D 12 and L 1 and two at L 2-3. (In one of these last cases the Sartorius muscle which is supplied by the anterior crural nerve the origin of which is at L 2-4, remained unaffected.) That the interruption (physiological) of the cord in these cases was complete was evidenced by the loss of all motion and sensation as well as of all the reflexes below the affected segments, a loss which showed no tendency to recede as late as a month after the injury. I also saw four cases with traumatic lesions of the *conus medullaris* (the sacral cord) and one with such a lesion to the upper cauda. The injuries to the cord in the foregoing cases were brought about by bullets in three and by indirect violence as by the patient falling from a height or by a heavy weight falling on him in the remaining cases.

Retention of urine, with or without incontinence of overflow, was the primary disturbance of the bladder function in all these cases.

Retention of urine as the initial disturbance of bladder function is noted also in cases of hemorrhage in the cord, either spontaneous or traumatic (*hematomyelia*). I saw four such cases in the last two years. In three of these, all males, the hemorrhage was the result of an injury; in the fourth, a woman, aged thirty-one, in whom it occurred in the eighth month of pregnancy, it was apparently brought about by acute nephritis and hypertension from which she was suffering at that time. The hemorrhage in all these cases

occurred in the dorsal region of the cord—in none did it involve the lumbosacral segments, as was shown by the spasticity, the positive Babinski and flexor spasms in the lower limbs.

In two of these cases, a man, aged fifty-five, and the woman, there was a clear-cut dissociation of sensation. They had a complete loss of sensation when pricked by a pin or when a drop of boiling water or an ethylchloride spray was applied below the level of the lesion, while sensation of light touch and position was fairly well preserved. In the others the hemorrhage apparently brought about a complete interruption of the cord so that all types of sensation below the affected level, were abolished.

Retention of urine with or without incontinence of overflow, occurs in about 45 per cent of the cases of *tabes dorsalis*. It frequently manifests itself in the early stage of this disease as straining at urination, and may be one of the earliest phenomena of the trouble, antedating even the loss of the pupillary reaction. Retention of urine, as the primary disturbance of bladder function, finally occurs in tumors of the cord whenever the seat of the growth is above the conus. The retention, which may set in with great suddenness, is generally a late symptom developing only after the sensory tracts have been more or less severely damaged. The retention is then brought about by the involvement of the fiber tracts of the bladder on their way to and from the cerebrum (the *juxta-grisseal* pathway of L. Davis [11]).

Retention which may persist for months occurs also in tumors of the conus whenever the structures affected are exclusively or predominantly in the sensory sphere and the patient is suffering from the familiar saddle-shaped areas of anesthesia, and loss of sensation on the posterior surface of legs and thigh but has no motor paralysis. On the other hand in the case of tumors that involve the motor nuclei, and are associated with flaccid paralysis of the limbs, of the gluteal muscles, and muscles of the perineum the retention is more apt to give way early to the second type of bladder disturbances, known as passive incontinence.

I saw six cases of tumors of the cord in the last two years all of which have come to operation. These affected the cord at the following levels: One at D 4-6; one at D 9-11, and four at the conus.

The initial retention of urine may in some cases persist for a long time. In one case with complete physiological interruption of the cord at the level of L 2, which I have under observation at present, the patient is still suffering from persistent urinary retention although fourteen months have elapsed since his injury. The retention is, however, sooner or later succeeded by "passive incontinence." In

this condition the urine dribbles away from the bladder almost continuously and escapes in considerable quantities whenever the patient is subjected to a change of posture. Passive incontinence is generally the terminal type of bladder disturbance. It forms the most distressing symptoms of the patient with transverse myelitis regardless of its origin, whether caused by trauma, an inflammatory process or by tumor. It sets in with particular rapidity on lesion of the lower cauda equina; in other words, in any lesion which affects the sacral segments, or their peripheral nerve fibers.

Another type of bladder disturbance which occasionally follows retention is the so-called active incontinence, also designated "the automatic bladder" (Head and Riddoch [12]). In this condition as soon as a certain quantity of urine, generally from 100 to 300 c.c. accumulates in the bladder, micturition takes place reflexly. The urine in such cases passes out in a jet; the act is entirely reflex, the patient being unable to initiate it or suppress it, and he may be totally unconscious of its occurrence. Frequently, however, he is conscious of a distention of the bladder by its effect on the abdominal wall and he may be able to bring about the expulsion of the urine at certain more or less regular intervals. This type of bladder action occurs in favorable condition when the patient's general condition is good and there is no cystitis. It may occur in complete anatomic interruption of the cord and, according to Head and Riddoch, even in lesion of the conus and cauda. It occurred in three cases with complete division of the cord that have come to my notice, one with such division of the cord at the level of C 6, one with such a lesion at L 2, and one in a case of hematomyelia at D 6. It did not occur in my cases of a lesion to the conus.

"PATHOLOGICAL PHYSIOLOGY OF THESE BLADDER DISTURBANCES"

Head and Riddoch attribute retention of urine in lesions of the spinal cord to overaction of the internal sphincter. This is also the view of Hunter.(13) Gowers identifies the overaction of the external or voluntary sphincter with the hyperactivity of the voluntary muscles following a lesion of the pyramidal tracts as a result of which they respond to stimulation by increased reflex activity. This theory is open to criticism. First—retention of urine is constant as the primary disturbance of the bladder in complete transverse lesion of the cord; a lesion which is associated with loss of all reflex action below the affected segment. And it is inconceivable that a lesion which abolishes all reflex action would at the same time be associated with vigorous reflex activity by the sphincter. Furthermore, retention is noted as an early symptom in about 45 per cent

of the cases of *tabes dorsalis*, a disease in which the degenerative process, it may be assumed, affects also the sympathetic nervous system, as evidenced by the extreme miosis of the pupils—the “pin-point” pupils. The miosis, it will be noted, occurs in association with a paralysis of the midbrain autonomic, passing by way of the third nerve to the sphincter of the iris, and failure of the pupils to react to light. It cannot consequently be ascribed to hyperactivity of the third nerve and must be brought about by a paralysis of the ciliospinal fibers of the sympathetic, the normal action of which is to dilate the pupil. An identically destructive effect on the sympathetic is exerted, it may be assumed, by the lesions of *tabes* in the case of bladder, producing a paralysis of the internal sphincter. That this is actually the case is shown by cystoscopic examination of the tabetic bladder when the outlet is seen to be funnel-shaped, the internal sphincter being relaxed. Another fact that is difficult to explain, if we assume with Head and Riddoch, Hunter, and others that the escape of urine in retention is prevented by the action of the sphincter, is the early incontinence which so frequently occurs in lesions of the conus and of the lower cauda. These lesions affect only the internal pubic nerve and the pelvic autonomic nerves, leaving the sympathetic nerves to the bladder intact, and yet incontinence in these cases sets in early, much earlier as a rule, than in lesions above these structures.

I, therefore, propose the view that the bladder disturbances in lesions of the spinal cord are produced primarily by a paralysis of the bladder wall, the so-called detrusor muscle, through a paralysis of the pelvic autonomic nervous system, the sympathetic playing little, if any, rôle in their production; and that the nature of the disturbance is determined by the condition of the pelvic floor as is brought about by the lesion. To understand the effect of the condition of the pelvic floor on the bladder disturbance, it will be necessary to bear in mind that this structure exerts a mechanical effect upon the urethra, keeping it firmly compressed. Urine, for this reason, does not escape from the bladder of the fresh cadaver, no matter in what position the body is placed. We, therefore, note that immediately following a lesion of the cord, while the musculature of the perineum is firm and continues to act as a strong support for the pelvic organ, the resulting disturbance of the bladder is, regardless of the segments of the cord injured, urinary retention, the urine accumulating in the bladder in consequence of the failure on the part of the organ to contract while the urethra is mechanically compressed.

Later on, however, with the continuance of the paralysis, the musculature of the perineum becomes flabby and relaxed, and the

pelvic floor ceasing to exert its mechanical effect on the urethra, allows urine to escape, first as an incontinence of overflow and later as a passive incontinence. The passive incontinence sets in with especial rapidity in lesions of the conus and of the lower cauda, lesions which involve also the internal pudic nerve, the lower motor neurones to the muscles of the perineum, bringing about a flaccid paralysis and rapid wasting of these muscles.

This view explains also the rarity with which active incontinence or automatic bladder action is noted in lesions of the conus or of the lower cauda, a type of bladder disturbance which I personally have not seen to occur in these lesions. In active incontinence the ganglia in the bladder wall act automatically, independently of the spinal cord, from which they are separated by the lesion. The bladder in this condition contracts and expels its contents whenever the quantity of urine accumulated is sufficient to produce a certain degree of tension in the bladder wall, generally from 100 to 300 c.c. It is of course clear that if the musculature of the perineum is wasted and the pelvic floor relaxed, as is the case in lesions of the conus and of the lower cauda, a comparatively short time after the injury, the urine will dribble away almost as soon as it enters the bladder, allowing but little or no tension in the bladder wall to occur.

This theory also offers a good explanation of the incontinence which is so frequently observed early in *tabes dorsalis* (over 50 per cent of the cases). As is well known, the degenerative process in this disease affects very early the tonicity of the voluntary muscles, as a result of which the muscles become flabby, the joints in the case of the extremities become flail, and the tendon reflexes are diminished or lost. An identical effect is undoubtedly exhibited by the tabetic lesions on the musculature of the perineum, so that the pelvic floor becomes relaxed and flabby and incontinence sets in. The incontinence, according to this view, is independent of the sensory impairment so common in this disease, and is not caused by failure on the part of the patient to feel the evacuation of the bladder. We accordingly find a condition that I have personally observed, that incontinence occurs in *tabes* in the absence of any detectable impairment of sensation anywhere in the body.

This theory, assigning to the sympathetic nervous system a small or no part in the production of bladder disturbance of nervous origin, is, finally, in accord with the experimental studies of Barrington. This author has shown that under ordinary circumstances the bladder action is controlled entirely through the pelvic autonomic nervous system, the sympathetic nervous system, according to him, coming

into play only when unusually tight closure of the sphincter is required, as when during ejaculation of the seminal fluid the fluid is to be prevented from passing into the bladder.

SUMMARY

Retention of urine or, in the case of less severe affections, its minor manifestations, namely, straining at urination and frequency of urination, constitute the initial type of bladder disturbance which occurs in all lesions of the spinal cord when the seat of the lesion is above the conus. The bladder disturbance in such cases is brought about by the destruction of the fiber tracts which form the vesical pathways on their way to and from the cerebrum. These tracts appear to offer a good deal of resistance to a slowly developing destructive process (inflammation, softening, or neoplasm), and the bladder disturbance in such conditions is generally a late symptom.

In lesions of the conus or of the cauda equina retention of urine is the initial type of bladder disturbance when the lesion, in addition to causing paralysis of the pelvic autonomic nervous system, involves the posterior horns or posterior roots, but does not involve the motor nuclei or anterior roots of the internal pudic, in which case there is no flaccid paralysis of the musculature of the perineum.

Lesions of the conus or cauda equina that are, on the other hand, associated from the outset with, respectively, an involvement of the motor nuclei of the internal pudic or of its anterior roots, and a flaccid paralysis of the muscles of the perineum, may have passive incontinence as the earliest manifestation of disturbance of bladder function. The nuclei of origin in the conus, as well as the roots forming the cauda, appear to be less resistant than the fiber tracts of the bladder in the spinal cord (an assumption which is supported by the fact that toxic substances of various kinds, whether metallic [such as arsenic, lead, or mercury], bacterial [as in diphtheria, typhoid, or tuberculosis], or metabolic [as in diabetes or nephritis], on circulating in the blood in sufficient concentration, frequently produce mono- or polyneuritis, whereas they only exceptionally produce destruction of the conduction tracts in the cord), and bladder disturbances in lesions of these structures are comparatively early in their development.

The retention, whether the result of a lesion of the spinal cord, conus or cauda equina, may or may not be associated with incontinence of overflow. It is generally soon or later succeeded by passive incontinence, a condition which forms the terminal state of failure of bladder function in all cases that do not end in recovery. In some cases, however, when the general health is good, and he did not suffer

from long continued cystitis, the retention may be followed by the so-called automatic bladder or active incontinence.

Retention of urine, or incontinence of urine, is generally one of the earliest manifestations of *tabes dorsalis*, the proportion of cases in which either type of these disturbances occurs being about equal.

The retention is the result of failure of the expulsive power of the bladder owing to the paralysis of the pelvic autonomic nervous system and the detrusor muscle, the escape of urine by gravity being prevented by the mechanical action of the musculature of the perineum which keeps the urethra firmly compressed, and is not due to overaction by the internal or external sphincter, and overaction which cannot occur in *tabes dorsalis* or in complete transverse lesion of the cord, a lesion which is associated with complete loss of reflex action below the level of the lesion. In complete transverse lesion of the cord (at least in the early stage following such injury, at the time when the peripheral vessels below the level of the lesion show paralysis of the vasoconstrictors, so that the surface temperature below this level is higher than in the area above it (14) as well as in *tabes dorsalis*, it may be assumed that the sympathetic nervous system of the bladder is paralyzed simultaneously with the pelvic autonomic nervous system, and does not function independently of the cord by virtue of its ganglia in the mesenteric plexus. Such paralysis is undoubtedly associated with the relaxation of the internal sphincter and probably hastens the development of incontinence. It does not, however, prevent the urine from accumulating in the bladder so long as the musculature of the perineum is of good volume, the pelvic floor is taut, and the urethra, as a result, is firmly compressed.

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PSYCHOSES IN CRIMINALS: CLINICAL STUDIES IN THE PSYCHOPATHOLOGY OF CRIME *

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FOREWORD

During the past six years I have had the opportunity to observe and study rather intimately a fairly large number of cases in the Department for Criminal Insane at St. Elizabeths Hospital. I soon came to realize that, in some significant way, these cases differed considerably from the usual run of the civilian psychiatric material; and it seemed worth while to me to study these differences. Reading the literature on the subject, I was impressed with the confusion that still prevails as regards the nature of prison reactions. For this reason I deemed it best to ignore, to a large extent, the material offered heretofore and to present in its stead the results based on our own material. This, to be sure, may have its limitations, but it

* From the Department for Criminal Insane (Howard Hall), St. Elizabeths Hospital, Washington, D. C. This is the first of a series of articles on the subject.

has the advantage of intimacy and comes nearer to expressing the situation as I see it.

The primary aim of this contribution is to present a series of intimate psychopathological studies of the individual criminal. It is believed that longitudinal studies based on carefully correlated material of each individual criminal, his personality make-up, the psychological setting in which the crime was committed, and the particular reaction manifested on and following imprisonment, should go far toward helping us to understand criminality, not as an isolated phenomenon, but as a total life reaction and a specific expression of a diseased personality at the psychological level. While the material offered here is mainly neuropsychiatric, it is maintained that, in a larger sense, the abnormal is merely an exaggeration or distortion of the normal. Nevertheless, such study cannot be considered complete until similar investigations of "normal" prisoners in jails and penitentiaries are made.

The larger part of the material to be presented comes from cases personally observed and studied in the Department for Criminal Insane. To this have been added a certain number of cases selected from some two thousand past records. Many of these, particularly since the coming of Dr. Wm. A. White, the present Superintendent, contain excellent material which I freely utilized. Finally, a certain number of cases has been included from the noncriminal service, patients who either have had a criminal record or exhibited throughout their life criminal reactions, although not actually arrested or confined.

A word may be offered about the nature of the material. It has been said in criticism that the criminal material at St. Elizabeths Hospital is rather one-sided. A careful perusal of it as a whole will convince anyone that, except perhaps for numbers, the material from St. Elizabeths is, in fact, quite superior to that obtained in State Hospitals for Criminal Insane; for, in addition to the prisoners that come to us from the civil population of the District of Columbia furnishing us with a quota of crimes and criminals that does not in any essential manner differ from a numerically equivalent population in any other part of the country, we also get military and federal prisoners, who have a somewhat different color and composition.

I. INTRODUCTION

It is hardly an exaggeration to say that there is no field of human endeavor which has demanded such prodigious expenditure of energy

and has yet shown such disproportionate poverty of results as the study and treatment of crime. Having chosen for itself the specific task of studying those conflicts between individual and society which express themselves in antisocial behavior, criminology has most signally failed to throw any light on the fundamental causes of crime on the basis of which it could develop measures to deal effectively with antisocial conduct. It has sought the cause of crime in physical environment—climate, season, etc.—blamed the city or country as the case might be, accumulated a stupendous mass of statistical and descriptive material showing distributions, correlations, etc., has erected a most complex and costly system of legal and social machinery to deal with crime, and yet crime is on the increase and the problem is as acute as ever.

The causes for this failure are numerous and are largely inherent in the nature of the subject matter of the social sciences. It is not only much more complex and variable than the subject matter of the natural sciences, but its means of research are less delicate and adequate. True it is also that social phenomena can not be studied by the experimental method nor viewed so dispassionately and with the same degree of personal detachment as natural phenomena. This is particularly true of the study of crime, for here our most intense passions and prejudices are aroused. And so it happens that in criminological research the dynamic factor in the entire system of relations—the individual criminal, has practically been lost sight of, while the greatest weight has been given to crime as such. Again, in the relations between criminals as a class and society, the entire blame was thrown on the former while the latter was regarded as a passive factor not in any direct manner responsible for the crime.

It is only of recent years, through the failure to find any means to lessen crime, that we have come to feel that the solution of the problem must be sought somewhere else. Help came unexpectedly from a source heretofore not counted on as being in any way related to the problem. It was observed by psychiatrists that in some instances at least the crime was apparently not wilfully intentioned, but was rather the result of some mental aberration, although in other respects the individual seemed quite normal. Further than that, it was sometimes observed, in the course of psychoanalytic studies, that criminal behavior often served as an outlet for, and symbolically expressed, some underlying emotional conflicts, as in kleptomania, exhibitionism, pyromania, etc. It is quite significant, therefore, as an expression of the changing point of view that text books on criminology speak now of criminal conduct as being deter-

mined, like other forms of conduct, by mental states. But in the solution of the problem of criminal conduct must be sought in the study of the mental states of the criminal, then psychopathology should be of great service to criminology, for motivation can most easily be discovered in pathological behavior. Indeed, if criminology is to become a science that is theoretically well grounded and practically useful, it must take the form of a science of criminal psychopathology. Our immediate task, therefore, is to determine the larger aims and means of the science of criminal psychopathology.

II. THE PSYCHOPATHOLOGY OF THE CRIMINAL CONSTITUTION

1. *The Criminal and the Insane*

It is estimated that in the United States there yearly pass through and are confined in jails and prisons about one million people. There are, on the other hand, at least an equal number of people who may be regarded as being mentally ill or mentally deficient and requiring, by reason of this, institutional or extra-institutional care. In the popular and even scientific mind it has always been supposed that a wide gulf existed between the two, and that there was not, in fact, any particular relation between these types of maladaptation; it being reasoned that the former was an expression of a vicious temperament which showed itself in marked antisocial and criminal behavior, while the latter was due to a defective inheritance. It was also observed that rather frequently criminals developed various types of psychoses and conversely, that psychotics would quite often come in conflict with law; these two groups making up the larger part of what we have come to know as the criminal insane. The psychiatrists, too, in accordance with the popular conception, have regarded the division as complete and distinct.

Gradually, however, we have come to realize that quite an intimate relation exists between crime and psychosis, it being conceived that underlying crime were basic defects which, in a large measure, were also responsible for behavior distinctly psychotic, both criminality and psychosis being regarded as outgrowths having a common origin and background. Such conception of a common genesis of both crime and insanity has been gaining considerable ground but it still lacks, in a very large measure, the clinical evidence necessary to place it on a scientific basis.

Here in the United States but little of significance has been contributed to the psychopathology of the criminal beyond the important works of Glueck and Lind, although considerable work has been done

by Healy, Adler and others on the youthful delinquent. In other countries, notably in Germany, much work has been done since 1854 when Delbruck published his first report. Subsequent workers have concerned themselves largely, if not entirely, with the clinical delimitation and classification of cases observed and regarded as prison psychoses, each writer offering his own classification based on his own particular type of material. As the histories are in most instances neither completely described nor adequately discussed, it is difficult for one to form a correct idea as to the actual character of the material studied. On the other hand, even at best, all these studies, not even excepting the most recent works of Birnbaum, were made at the descriptive level for the purpose of further delimiting various diagnostic entities but with no significant attempt to understand either the basic psychopathology underlying criminal behavior or the differential nature of the reactions observed in prisoners developing psychoses. However, mention must here be made of the very significant contributions of Stekel who, although not primarily a criminologist, has, in the course of his analytic studies, uncovered much that bears on the psychopathology of antisocial behavior.*

* Stekel's remarks concerning criminality are highly suggestive but unfortunately scattered throughout his works and in no place does he discuss the concept as a whole. Summed up, his views are somewhat as follows: Analyses of neurotics show them to be distinguished by exceptionally strong egoistic and sexual appetites which are in every way opposed to the demands of social culture. The neurotic's "will to power" is markedly hypertrophied, his egotism knows no bounds. His antisocial and therefore criminal tendencies stand nearly always in the service of the sexual (perhaps every criminal is a sexual criminal); but the moral ego will not allow the instinctive ego a chance. There is thus in the neurotic, a constant conflict between the primitive and civilized man, between strong, instinctive, socially tabooed, impulsive drives, the satisfaction of which would be adequate to himself, and a feeling of duty for social obedience in the service of culture. In this struggle the neurotic has constantly to contend against a variety of atavistic impulses, in the suppression of which he must expend so much energy, that socially he is quite worthless. His criminality sums up these antisocial dispositions which are perpetually endeavoring to come to the surface and procure enhanced pleasures for the ego; conscience and morality represent the sum total of all inhibitive ideas that interpose themselves between impulse and action.

Confronted with the dilemma, the neurotic finds himself unable to solve the problem satisfactorily. He lacks the courage to commit a crime. (Is the criminal a neurotic with the courage to commit a crime? B. K.) As his criminal tendencies are not released, the neurotic comes to fear his own criminal impulses and, in consequence of this, develops as a defense reaction, to save the moral ego from destruction, a variety of anxiety states which express in varied degree his ability or inability to cope with the conflict. These anxiety states are crises that arise from the neurotic's fear that his instinctive ego might overpower the moral ego; it is the fear of one's self. It is virtue that makes the neurotic what he is. Ungratified, he actually has only the choice between crime and neurosis. (Our virtues often originate as a reaction to suppressed vice and the good has often missed being a crime by a hair's breadth.) The anxiety states are thus expressive of repressed desires and a

2. *The Problem of Criminal Personality*

We, therefore, take it as a cardinal point in our discussion that criminal behavior can not be understood if criminals are treated en masse and crime considered as an isolated phenomenon; on the contrary the criminal must be individualized and his criminal reaction correlated with the rest of the personality of which it is an expression. We define here personality as the totality of reactive manifestations displayed by an individual in his environmental adaptations by which he is differentiated from other members of the same species. Although we are as yet far from understanding the various factors that enter into the make-up of personality upon the orderly integration of which an adequate life adjustment depends, it will be readily granted, as according with sound clinical experience, that the very failure at social adaptation is due to certain basic personality defects in the individual which in a variety of combinations express different types of maladjustment. We may briefly inquire now into the factors which are at the basis of the personality makeup, the conditions upon which personality defects depend in an attempt to delimit the criminal personality, if such there be, as a specific type of maladjustment.

While it is not desired to enter here intimate discussion of the psychobiological bases of human personality, it may seem profitable to mention some of the broader principles which are immediately essential for the proper understanding of our problem. On the basis of material at present available, it appears not unreasonable to postulate three fundamental animal instincts: namely, the ego, sex and gregarious instincts, all rooted in the very biologic makeup of the individual animal; and, further to view the many apparently independent instinctive reactions as modifications and extensions of these three fundamental drives that grew out of the complexity of our life. It seems to me, therefore, that it would serve us no

badly diseased conscience; in the clashing of the conflicting drives, the stronger one remains dominant and asserts itself while the weaker appears in consciousness as anxiety.

In the light of this, the significance of many neurotic reactions becomes understandable. Every useless excitement observed in neurotics, such as throwing furniture about, breaking things, etc., is merely a substitute for some criminal act; rage is the direct outburst of the criminal component—destructive hate. Active criminality becomes passive anxiety. The neurotic is, of course, seldom conscious of his criminal tendencies and they are most frequently given expression to in his infantile criminal phantasies and in his dreams; it is at night that the secret criminal makes his appearance. The neurotic's dreams frequently concern themselves with execution of criminal acts—stabbing, killing people; with burglars, being pursued, etc. In dreams his secret death wishes express passive criminality; his violations are ardent longing for the attainment of an unconscious ideal; he revels in pleasure without guilt.

useful purpose to go beyond that and describe an infinite multitude of instinctive trends and tendencies manifested by human beings when in the course of evolution the activities of man have been greatly overlaid and obscured by a variety of modifiable factors, as habits and intelligence. However, a simplification of the problem as here outlined should not prevent us from recognizing that each of the fundamental instinctive drives spoken of has its many and large ramifications and they are all intimately correlated, producing through many interreactions in the human being what we have come to know as personality. It is conceived that the harmonious working of these instincts, opposed as they often are to each other, produce the normal personality, and in the majority of cases they must all be regarded as inseparable parts of one working unit so integrated as to bring about the greatest welfare of the organism as a whole, both as individual and as a member of society. However, with the growing complexity of life, the manifold expressions of these instincts often become so abnormally modified, disturbed or distorted as to bring them in opposition to each other and thus produce personality defects which are responsible for the abnormal behavior of the individual. Regarding the total life force within each organism as a constant and each individual instinctive drive as a function of this constant, it will be recognized that whatever deficiencies or distortions may occur in any one of the primary instincts, they must of necessity reflect on the work of other units, and hence on the efficiency of the entire organism; but obviously types of abnormal behavior will differ depending upon which instinct or its ramifications is primarily affected.

We have already stated that, especially as seen in the human being, instinctive drives frequently come into conflict with each other and thus produce personality defects upon which abnormal behavior becomes conditioned. It must now be stated more specifically that, whatever conflicts may exist between various ego and sex drives, they never, in themselves, produce distortions of personality abnormal enough to be manifested by neurotic or psychotic reactions unless and until they, in turn, come into conflict with the expressions of the gregarious instincts; that is, with the urge that drives the individual to live up the standards set by the herd. Such clash of instincts, while quite universal in the human being by reason of his larger mental and psychic equipment, is practically unknown among animals in whom instinct manifestations approach the automatic type and are accompanied by little of conscious reaction—otherwise, psychoses in animals would be a frequent enough occurrence. Since

the expressions of ego instinct, even in their higher ramifications, such as artistic, seldom encounter on the part of society great enough opposition to prevent their legitimate satisfaction, while, on the other hand, the expressions of the sexual instinct have always been subject to numberless restrictions from the taboos of the savage to the codified and unwritten prohibitions of modern society, it is not surprising that, at the basis of abnormal human behavior, some major abnormality in the function of sex should so universally be found.

We feel, therefore, that there is every justification to view human behavior, normal as well as abnormal, against the background of social adaptation. We thus conceive a normal individual as one in whom there is a relatively complete harmony between himself and society; when, on the other hand, the individual suffers from sexual difficulties that may be quite obvious or fairly cryptic, but apparently makes a reasonably good social adjustment, we have the psychoneurotic. In the instance of the constitutional psychopath we have an individual who, no doubt, has fundamental sexual difficulties, but whose conflicts, superficially at least, appear to be reflected largely in his inability to make an adequate social adjustment. In the case of the psychotic we find a fertile soil with a large number of sexual as well as social difficulties. Finally, we have the defective who shows arrested development at every level of life and, because he is guided by the more primitive and immediate needs of the organism, frequently comes into conflicts with society. It would be reasonable enough to suppose that the cause of committing crime must be different in these different types of personalities—the psychoneurotic, psychopathic, psychotic and defective, while their reactions to crime and confinement must also be expected to be quite different. It is these fundamental differences that justify one grouping the criminal on the basis of original personality make-up and psychogenesis of crime and psychosis.

3. The Relation Between Personality Make-Up and Crime: The Criminal Insane—The Criminal

In a study mainly clinical, it would be hardly legitimate to theorize beyond the conclusions that naturally follow the clinical material presented; hence, speculation will be attempted only in so far as it is supported by the actual facts. However, for the better orientation of the reader, it is perhaps worth while to outline in a somewhat anticipatory manner those broader general aspects of the problem which force themselves upon the disinterested student of criminal psychopathology after the careful perusal of the material.

In the discussion of the personality basis in crime and insanity, several things deserve primary consideration. In the first place, it is important to determine the relation of the personality make-up to the commission of the crime; a problem which in turn leads to the question of the characterological aspects of crime—does a particular type of personality commit a particular type of crime, or is the crime committed merely a matter of chance; and in the second place, how far does this original personality makeup and the nature of the crime committed determine the type of the reaction the individual will develop on arrest and while in confinement; and finally, have not perhaps these factors a common basis which conditions the criminal behavior no less than it does the psychotic expression?

From what has already been said regarding the relation between personality make-up, criminality and psychosis, it would seem as if we have at least several types of criminal personalities, each expressing through antisocial behavior some specific underlying defects and difficulties; and apparently, there must also be some marked qualitative differences between the paranoiac who kills because of his paranoid ideas, the psychoneurotic guilty of indecent exposure, the psychopath guilty of forging checks or of bigamy, and the so-called normal man who either under stress or even apparently in cold blood and with premeditation kills another human being. What, indeed, can there be common between these widely different personalities that would lead them to commit different crimes or even the same crime for widely different reasons? And yet, we may well ask ourselves, is there not perhaps behind all of this behavior some common driving force which although expressing itself differently because of different modifying factors, is nevertheless, the primary force that shapes, molds and guides these different reactions in accordance with a particular psychic need to be served.

On the basis of clinical experience it seems reasonably certain that the criminal behavior of psychotics is all but universally conditioned (the constitutional factors being granted) by some unsolved psychosexual difficulties which appear to be directly responsible for the commission of the offense. The presence of abnormal and socially unacceptable sexual drives leads to a distortion of the personality, and loss of contact with society that often results in antisocial behavior. What is not so clear, however, is that there is an unusually large number of psychotics seemingly in no wise differing from the criminal type and apparently having the same psychosexual difficulties, but whose behavior somehow or other does not lead to

any marked breach of social discipline. Evidently, in order that the behavior should assume a criminal turn something more is required than the mere presence of such difficulties. Either these difficulties are of a different degree or of a particular kind, or else there must be present in the personality of the criminal psychotic an additional element or trait that in the presence of other factors leads the individual to criminal behavior, while its very lack would preclude the possibility of such behavior.

Similarly, a study of the life history of psychoneurotics who have come in conflict with law, be they guilty of rape, obscene letter writing or murder, discloses in their psychosexual life some significant defects which appear to be directly responsible for the commission of the offense. In common with the psychotic, the psychoneurotic too suffers from numerous conflicts at the psychosexual level, although unlike the psychotic, his herd instinct does not appear to be so prominently affected; and he also lacks the marked regressive features which are so characteristic of the psychotic. But here too, in view of the fact that a great many psychoneurotics never do come in conflict with law, we must pause and ask ourselves, whether after all we are not dealing here with a situation somewhat similar to that described as regards the psychotics—namely, whether the psychoneurotic criminal is not in some respects a type differing from the non-criminal psychoneurotic, or is there merely a difference in the degree of the underlying difficulties.

The psychobiological difficulties of the psychotic and the psychoneurotic often stand out so prominently that we have little difficulty in convincing ourselves of their undoubted presence and the dynamic rôle they play in the behavior of the individual. Even though the question is left open as regards the differences in the personality makeup of the psychotic and the psychoneurotic criminal as compared with the non-criminal psychotic and psychoneurotic, it is quite clear that in the absence of such psychobiological difficulties, there would be neither psychotic, psychoneurotic nor criminal. When, however, we come to the question of the psychopathic and defective criminal, we are confronted by a problem more difficult and puzzling. Whereas in the instance of the psychotic and psychoneurotic we find distortions, fixations and deviations in the sexual mechanism, such does not appear to be the case with the psychopath. Here, outwardly at least, the primary difficulty seems to be in the social sphere and the sexual life appears normal, no striking pathologic features being observable. They are the most difficult class of cases to study psychopathologically, as the great majority of them are inveterate

liars, and quite uncoöperative, and it is far from easy to learn from them where their primary difficulties lie. But every now and then we get a glimpse of one significant fact or another, and sufficient evidence is accumulating to lead one to think that not all is well with the sexual life of the psychopath as it would at first seem to be. All too frequently we find in them a history of excessive venery that is quite pathological in nature, precocious sexual development and early eroticism, which will perhaps explain, in part at least, why they are so unteachable and so unmanageable. The exaggerated ego reactions with the consequent thinning of the herd-instincts give us a clue to the explanation of some psychopathic traits.

In the case of the defective we have an individual who lacks, in a large measure, the herd instinct, whose sexual life is frequently undeveloped, especially in its social aspects, and who is guided by the more primitive and more immediate needs of the organism, that is, the nutritive and the pleasure giving aspects of sex. He shows arrested development at every level, which explains his frequent conflicts with society.

Thus far we have seen that the genesis of criminal behavior of the psychotic, psychoneurotic, psychopathic and defective can be traced to some malformation, or distortion of the primary instincts and that by-far the larger rôle must be assigned to abnormalities in the expression of the sexual instincts. When we come to deal with the so-called "normal" criminal, more frequently the murderer, who commits the crime in a situation of some great stress, the temptation is very strong to attribute the crime to the particular situation in question; and yet here too we must bear in mind that a great many other people often find themselves in quite similar situations and yet do not commit the crime. Evidently, some factor must be present or absent in the personality make-up of this individual criminal, which is not present or absent in the normal man and which, in the presence of a stressful situation, leads to the commission of the crime. Is it a markedly exaggerated ego instinct which brooks no opposition and must remove all obstacles? Is it a regressive phenomenon, a reaction like that of a child which forthwith removes that with which it is displeased? The crimes of the so-called normal man, particularly the murderer, are very frequently precipitated in a sexual setting. Is it that the sexual urge is so strong that it must remove all obstacles in its way even if it is the question of the life of another human being and even that of his own—the race must be preserved at all costs, even if the individual is to perish? This problem must be left open for the present as sufficient data on this point are not available.

4. *The Relation Between Personality Make-Up and Reaction to Crime and Confinement*

The Criminal Insane—The Insane

Confinement in prison represents an acute crisis in the life of an individual and it may well be expected that he would show some kind of reaction to this entirely new situation and environment. The immediate background for this new adjustment lies in the circumstances of the crime, length of the sentence and nature of the prison environment, but the soil and the matrix are to be traced to the original personality of the individual and the psychogenic difficulties which, in the long run, were responsible for the commission of the crime. It is, therefore, essential for us to inquire what, in general, may be the reaction of various types of personality on the commission of crime and confinement following it.

We may take it as a general proposition that other things being equal the closer the interests of individual are to life, the more acute and heightened will be his reaction to confinement. The reaction of the psychotic criminal is what one might have anticipated under the circumstances. To take a precox criminal as an example. The crime to him was a psychological necessity, a result of a long series of maladjustments with regression, introversion of attention, deterioration of interests and a gradually growing loss of touch with the environment. Social activities and life in general hold but little interest and attraction for him. Within the four walls of the prison, away from the persecutions and without the painful necessity of making a social adjustment that requires a greater expenditure of energy than he feels himself capable of, the psychotic breathes more freely in confinement than even at liberty. That which is a great driving force for the normal man-life in its endless beauty and diversity, carries but little significance for him. Most frequently a failure in life at heterosexual level, he can, while in prison indulge in idle and endless phantasies no less than when at liberty; and as for autoerotic or homosexual practices the prison offers as frequent opportunities as he ever enjoyed when free. It is not surprising, therefore, that as a rule the psychotic shows but little reaction to confinement and his behavior in prison is in no essential way different from his behavior when at liberty. When he (the psychotic) does react to confinement, such reaction is seldom accompanied by anything like the affective display or emotional tension that we observe in other prison reactions.

In the instance of the psychoneurotic we have an individual who, in terms of underlying psychogenic difficulties, has much in common with the psychotic, but who has, presumably by reason of better organization or less malignant difficulties, a far better touch with reality. On confinement, therefore, he reacts to the situation more acutely than does the psychotic. The psychopath, too, has his difficulties at the psychosexual and social level, but he is far more keenly in touch with life; hence, on confinement, he shows more frequently and to a greater degree a reaction markedly colored by his situation. It would seem that the so-called normal man, when he reacts at all, will show the most intense reaction and, there not being present in him any outstanding psychosexual difficulties or regressive nature, his whole psychosis appears essentially at a heterosexual level. To him confinement means deprivation and loss of all that is dearest and deepest to him in life. While his purely elemental needs may be satisfied, his major interests in life must remain ungratified. Unlike the precox, he cannot and will not remain satisfied with mere phantasying; nor could he ever reconcile himself to making a sexual adjustment at a level other than heterosexual; and it is because he finds no satisfaction at lower levels such as autoerotic and homosexual, that his reaction to confinement is accompanied by such a tremendous display of affect.

III. THE CLINICAL ASPECTS OF PRISON REACTIONS

1. *The Problem of Classification*

The difficulties confronting one who is attempting to deal with such complex and heterogeneous material as is obtained in a Hospital for Criminal Insane, are numerous indeed and are no doubt responsible for the fact that less constructive work has been done in this branch than perhaps in any other branch of psychiatry. At present some psychiatrists deny the existence of prison psychoses as a clinical entity, while others, admitting it, have no clear appreciation of the nature of the material. Even among the workers in the field the terms used are still vague and ill-defined and confusingly interchangeable. There exists not even unanimity as to what should properly come within the scope of prison reactions as distinct and apart from other nonprison reactions. Because each investigator was basing his conception of prison psychoses on his own, often very restricted, type of material, there has been considerable confusion and overlapping with undue emphasis on some aspects at the expense of others no less important, so that the student often found extreme

difficulty in orienting himself ; and up to date we have not yet evolved a conception of prison reactions that could logically fit in with other accepted conceptions of psychiatric nosology.

While a detailed discussion of the evolution of our conception of psychoses in prisoners is reserved for a later occasion, a few words may be said here regarding certain terms now current in psychiatric terminology.

It has been common in the past to include psychoses in prisoners in the general conception of *Psychoses of Degeneracy or of Degenerates*. The term has never been clearly defined. It was originally used by the French to designate psychoses, more particularly of the paranoid and manic-depressive types, in whom morbid predispositions, strong hereditary taint, and a markedly degenerative soil were all clearly recognizable. Objection to this has been made on the ground that these types of psychoses are frequently found in persons of particularly good make-up and negative heredity. Others have used this conception to denote those diseases that show a tendency to degenerate into profound dementia. Leaving aside the ambiguity of the conception and its odious implication that psychotics are degenerates, it is entirely useless, from the standpoint of criminal psychopathology, as it does not delimit the reaction types observed in prisoners, and fails to mark them off from other nonprison reactions.

Those who have particularly studied psychoses in prisoners have coined the term *Degenerative Prison Psychoses*, which has been given a more specific connotation than Psychoses of Degeneracy just spoken of. It is presumed to include all psychotic reactions that may be regarded as being largely, if not entirely, due to the prison milieu ; thus contrasting sharply with those reactions which are presumed to be endogenous in nature. As used, the term is merely another name for the general term Prison Psychoses, and is objectionable because it carries with it the implication that the basic make-up of individuals developing prison reactions is more than ordinarily defective and, by the same token, the prognosis is also unfavorable. Any one who has studied intimately prison reactions must recognize that neither of these formulations is correct ; for the basic make-up of these individuals is at least as good, and often better, than that found in the endogenous reactions, while the prognosis is certainly better. Some have given the term Degenerative Prison Psychoses a more specific meaning, including in these, more particularly, prison psychoses occurring in *habitual* criminals in the third decade of life. Here objection is made because the emphasis is laid on the age of the

individual and the frequency of his criminal activities—conditions which must be regarded as being of secondary import. It is hardly necessary to state that the delimitation of a clinical entity must depend upon the correlation of inner factors for its symptomatology and not upon incidental conditions. On the same general principles objection is made to classifying criminals into accidental, habitual, criminals by passion, etc.

The term Psychoses with *Psychopathic Personality* is used by many psychiatrists to cover the entire range and variety of prison psychoses. As may be seen from the discussion already given, this term is wholly inadequate, since prison reactions are not limited to psychopathic personalities, being not uncommonly observed in defectives, psychoneurotics, and psychotics as well. Again, it must be borne in mind that a psychopathic reaction may well be combined with dementia precox, manic-depressive psychoses, etc., reactions differing considerably from prison psychoses.

Hysterical Psychoses in Prisoners or *Hysterical Prison Psychoses* is another term not infrequently used to denote reactions in prisoners presumably due to imprisonment. As will be pointed out later, while prison reactions have a good deal in common with hysterical manifestations, they are not universally nor even commonly so, and the term *Hysterical Prison Psychoses* should be reserved for a very limited and specific group within the prison reactions.

Those who have dealt largely with criminal insane with a long or life sentence, as in the instance of murderers or "lifers," believed that these prisoners show reactions quite different from those who serve short sentences or are arrested for minor offenses. This, it must be said, has a certain element of truth in it, in so far as, *ceteris paribus*, a longer sentence is likely to provoke a more profound reaction; but it wholly misses the point of the relation between the personality make-up, the crime committed, and the reaction subsequently developed. Not infrequently one observes prisoners with a long sentence developing little or no reaction, while other individuals will react in a most profound manner to a relatively minor situation. There is no doubt a place for a characterological study of crime, but it is wholly against clinical experience to speak of the psychoses of murderers, robbers, thieves, etc., as separate nosological entities. As already pointed out, a more reasonable attempt toward a characterological understanding of crime would be to correlate the type of the original personality make-up of the individual committing the crime; and this further to be correlated with the reaction developed subsequent to the commission of the crime.

Similarly, an attempt has also been made to show that the reaction to confinement of a criminal by passion (specifically a murderer) is intrinsically different from that manifested by offenders against property. Here again it may be said that while the nature of the crime may contribute considerably toward the development of the reaction, it does not, *per se*, condition the nature of the reaction; and two murderers are sometimes likely to show much less similarity in their respective reactions than, for instance, a murderer compared with a robber.

A further attempt has been made by some to show that an individual awaiting trial exhibits a particular type of reaction quite different from that observed in prisoners who have already been sentenced or who have served a good part of their sentence. This reaction has been particularly emphasized by Ganser, whose name it bears, and is described as an acute confusional hallucinosis with catatonic and hysterical features (mutism, negativism, analgesia, etc.). The recovery is prompt and is followed by a complete amnesia. The attempt to establish a separate clinical entity for the reaction displayed by the individuals awaiting trial may have a certain justification in so far as such reaction is likely to be more acute, but it would be a gross mistake to regard such reactions as being specifically characteristic of those awaiting trial. The reaction has nothing in it that specifically separates it from other types of prison reactions, but is a mixture of hysterical, schizophrenic, and affect features—in fact, of everything that one often observes in acute prison reactions, whether such concern individuals as yet awaiting trial, after they have been sentenced, or even just before the expiration of the sentence. The creation of the Ganser's syndrome was no doubt useful at the time when we were still not clear about the nature of prison reactions; but with the growth of our conception of the latter, the use of the name has become obsolete. What must be emphasized is the nature of the reaction and not the time of its occurrence, which is rather an incidental factor; and it is neither necessary nor desirable to retain in the already overburdened symptomatology symptom complexes that now have more a historical than a practical interest.

The paranoia of criminals (prison paranoia of Delbruck) is another symptom complex presumed to be specifically characteristic of certain prisoners. While there may be some justification for viewing this as a clinical entity in so far as paranoid elaborations of prisoners have a number of distinctive features, it is well to emphasize here that in general a paranoid undercurrent is universally common among prisoners, that it is present in practically every case of prison

psychosis, singly or combined, and independent of any other reaction that may be displayed by the prisoner—a kind of “*ex officio*” prison symptom; and that while, in some features, it no doubt differs from the type of paranoid reaction to which individuals living in freedom are subject, there is no necessity to designate it as a special syndrome.

What is true of Gänser’s syndrome and Delbruck’s prison paranoia is also true of a number of other presumably distinct clinical entities which have been elaborated from time to time by various workers. The variety has grown so large and the shades of differences so highly refined and subtle that one is lost in a maze of these complex and well-nigh imperceptible differentiations that have little practical significance. Birnbaum, for instance (*Psychosen mit Wahnbildung und wahnhafte Einbildungen bei Degenerativen*), offers so many fine points in differential diagnosis between prison and non-prison psychoses that the symptomatology of one is quite often lost in the other and the schematization becomes more theoretical than clinical.

In the subsequent pages an attempt is made to present a clinical study of prison reactions in terms commonly understood and accepted in current psychiatry. Emphasis is laid on the relation which exists between the original personality make-up of the individual criminal, the crime committed, and the reaction subsequently developed.

Broadly speaking, the hospital prison population may be divided into two major groups. In the first group are included all those reactions not *per se* determined by the commission of the crime and the confinement proper, but rather by factors antedating these. The second group comprises those reactions that are primarily or largely conditioned by crime and confinement. We may then speak of the former as the endogenous and of the latter as the exogenous prison reaction types. It should be borne in mind, however, that these are not rigid diagnostic entities but rather reactive manifestations and tendencies which, in clinical experience, most often appear in a great variety of combinations and frequently merge into each other.

PRISON REACTION TYPES

1. THE ENDOGENOUS REACTION TYPES IN PRISONERS.

- A. THE CRIMINAL PSYCHOPATH (Types to be specified).
- B. THE CRIMINAL DEFECTIVE (Types to be specified).
- C. THE CRIMINAL PSYCHONEUROTIC (Types to be specified).

D. THE CRIMINAL PSYCHOTIC (THE TRUE OR ENDOGENOUS PSYCHOSES IN PRISONERS).

1. *Paranoia and Paranoid States.*
2. *Dementia Precox and Allied Conditions.*
3. *Manic-Depressive Psychoses.*
4. *Toxic Psychoses.*
5. *Epilepsy and Epileptic Psychoses.*
6. *Neurosyphilis.*
7. *Organic Brain Diseases (Other than Neurosyphilis).*
8. *Combined, Mixed, and Unclassified Psychoses.*

II. THE EXOGENOUS REACTION TYPES IN PRISONERS.

(*True Prison Psychoses; The Situational or Reactive Psychoses in Prisoners.*)

A. THE MORE PREDOMINANTLY SCHIZOPHRENIC REACTION TYPES.

1. *Malingering, Malingering Psychoses, and Allied States.*
2. *The Situational Psychoses Proper.*
 - a. *Acute Panic.*
 - b. *Paranoid States* (Types to be specified—depressive, compensatory, etc.).
 1. *Acute.*
 2. *Chronic.*
 - c. *Hallucinosis.*
 - d. *Confusional Hallucinosis.*
 - e. *Delirium.*
 - f. *Catatonic and Allied States.*
 - g. *Mixed Types.*
 - h. *Chronic Deterioration* (Types to be specified)
3. *The Regressive Prison Psychoses* (Types to be specified—acute, chronic, phantastic, etc.).

B. THE MORE PREDOMINANTLY AFFECT REACTION TYPES.

1. *Depression.*
2. *Agitated Depression.*
3. *Excitement.*
4. *Mixed Types.*
5. *With Schizophrenic Features.*

C. THE PSYCHONEUROTIC REACTION TYPES.

1. *Hysterical.*
2. *Neurasthenic.*
3. *Mixed Types.*

III-2. GENERAL CLINICAL CONSIDERATIONS: PARADIGMS

I. THE ENDOGENOUS REACTION TYPES IN PRISONERS

I-A. THE CRIMINAL PSYCHOPATH

In the psychopaths we have unstable individuals with marked volitional and temperamental but not obviously intellectual defects who are the criminals par excellence, their criminality resulting from psychopathic difficulties and maladjustments which eventually bring them in conflict with the law. They are most frequently the recidivists and habitual criminals, although the accidental and occasional criminal is also found in this group. The type of crime committed is usually against property, sexual crimes and homicides being relatively rare.

To confinement the psychopath usually reacts in a most acute manner. Even in his ordinary life reactions, the psychopath, so characteristically unteachable and unmanageable, stands restriction but ill and brooks no opposition to his pleasure loving, ever hungry, and all consuming ego. It is not surprising, therefore, that on confinement he frequently displays, in an acute form, a multitude of reactive manifestations, mostly of a situational character.

As an illustration, we may take the case of George Humphreys. His heredity, we learn, is rather bad but his own personal history appears quite good. He was a bright student in school but he played truant so frequently that he had to repeat two grades. Wherever there was trouble, George was sure to be there, and he usually got the worst of it. Even as a boy he had a temper, easy to anger and hard to appease; and it was useless to punish him as he would not be disciplined. At twelve he ran away from home and stayed for about a week. When he returned he was ragged, hungry, and all worn out. He would not say where he had been, but said he had had a good time. He managed to reach the first year of high school when he was expelled for having stolen a pair of scissors from the teacher's desk. Soon after he went to work for a grocer, and although he appeared to have learned the business he was discharged by the boss for no reason at all—so he says. His next job was as an apprentice to a plumber, but here, too, he stayed but a few months and left because he had an argument with the boss about getting off from work to see a ball game. Following this he went from one job to another, with frequent periods of unemployment, living in slums and associating with a low class of men and women. Excessive venery and alcoholic debauchery became a daily routine with him. He was intoxicated on numerous occasions and arrested several times

for that as well as for fighting. At twenty he decided to break away from his bad companions and enlist in the army. There he appeared to have gotten along well for the first six months, and except for some minor infractions of discipline, for which he spent a few days in the guardhouse, he did not get into any trouble. One day, while in the company of other soldiers, he happened to overstay his leave, and fearing that he might be given time in the guardhouse he decided not to return to the barracks. After traveling for three months from one place to another and failing to get along in any way, he decided to do what was right by the government and to give himself up to the authorities and take what punishment he might receive. He was tried by courtmartial on a charge of desertion and appropriating government property and sentenced to five years' imprisonment.

From the beginning he did not seem to get along well in prison. Everybody and everything seemed to be in his way; had fistic encounters with fellow prisoners as well as guards and prison regulations, and it was finally necessary to deprive him of all privileges and put him in an isolation cell on bread and water. One night he broke out in an excitement, smashed the window glass and broke his bed, cursing the guards aloud and threatening to kill them all if he is not given immediately his freedom. He was a real wild man then; subsequently he continued having such outbreaks of excitement, which, however, gradually subsided, and six months later he again appeared in his normal state.

I-B. THE CRIMINAL DEFECTIVE

As a group the defective must be marked off as being quite distinct and separate from other groups; for, although combinations occur frequently enough and the defective may in addition be also psychopathic, psychotic, or psychoneurotic, he need not necessarily be so. In this group we find individuals of the more primitive types of intelligence, who learn little and remember less, their judgment and lack of imagination preventing them from projecting themselves into future situations, from foreseeing or weighing the possible consequences of a deed for themselves or others, or from exercising self-control.

The crimes committed by this group are not as specific or limited in nature as those committed by members of the other groups. The reaction to confinement is not unlike that of the psychopath, although there is a cruder display of affect and not infrequently leads to deeper regressions. It is from this group that many of our so-called degenerative prison psychoses are recruited.

As an illustration we may take the case of Robert Gregory, a young colored boy who came under our observation at the age of twenty. He is the only child of the family. His physical history is negative. Began school at ten, studied for three years, but although otherwise well behaved, made poor progress and poor adjustment. In his sexual history he denies masturbation practices, but admits excessive heterosexual relations since the age of thirteen or fourteen. Venereal diseases denied. Began to indulge in alcoholics at seventeen and since then has indulged rather excessively.

His occupational history shows that at thirteen he began hanging around an express company where his grandfather was employed, and earned in this manner a little spending money. At fifteen he was given a position driving a carriage which paid him \$3.50 per week. Later on he obtained work in a warehouse at \$7.50 per week. Claims to have worked steady at this up to the time of his arrest.

A few months ago he and a friend, with the latter as the instigator and the leader, began stealing milk from stairs and houses; later they enlarged their sphere of activity and stole two blankets. Arrested, found guilty, but appeared deteriorated and confused, and seemed much distressed over his arrest and the possibility of a prison sentence. He was therefore sent to city hospital for mental observation and the case *nolle prossed*. The mental examination revealed no active psychosis, but a defective, moron with a mental age of eight years. There appeared nothing vicious about him. He talked in a childish, embarrassed manner, promising that he will never repeat the offense. His subsequent history shows that he made a good adjustment and that his conduct has been exemplary.

(To be continued)

PSYCHOSIS AS AN EARLY SIGN OF EPIDEMIC ENCEPHALITIS *

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The sequelae of epidemic encephalitis have been described by many workers since this disease has been known. The resulting conduct disorders in children have attracted considerable attention, on account of the extreme difficulty of adjusting these children to the average group life. On the other hand the early symptomatology of the disease has received less attention, and it seems worth while to us to report several cases which, as the first indication of the disorder presented familiar pictures of psychoses usually considered as functional. The four cases which we are presenting now all had a very acute onset, and only quite late in the disease developed neurological signs, which together with laboratory findings made possible a definite diagnosis of epidemic encephalitis. The psychoses thus seemed to be the first manifestation of the disorder, preceding the appearance of symptoms pointing to an organic process in the brain. There are several excellent communications, reported in the proceedings of the Association for Research in Nervous and Mental Diseases, (1) in which the different varieties of psychoses which may accompany or follow encephalitis are described. Exhaustive study has not been made and cases have not been reported where a psychosis represented the early stage of the disorder.

The review of the present case shows that one patient (Case No. 21745) presented an affective stupor and was diagnosed as such on admission to hospital; two other patients (Cases No. 21234, No. 21788) exhibited signs of an affective disorder of the manic type, characterized by overactivity, flight of ideas and distractibility; the fourth patient (Case No. 24147) was diagnosed as schizophrenia. The question naturally arises as to the cause of the resemblance of these cases to the supposedly functional psychoses. It seems that in acute diffuse organic processes the individual reacts with a certain psychic pattern, which depends largely upon his constitution. Thus the extrovertive syntonik individual would respond with a very typical affective reaction; while the schizoid personality would tend to react

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in a way which, on the surface, very closely resembles the schizophrenic processes.

One of the above patients with a manic picture, in spite of the diagnosis of encephalitis lethargica made in this hospital, was regarded as a manic-depressive excitement after he was transferred to another institution. Is it at all possible that many cases with a much milder onset, which do not terminate fatally, retain as a residual a psychosis which on later examination may be diagnosed as dementia precox or manic-depressive insanity? As a matter of fact a review of atypical cases in various diagnostic groups, has already been undertaken on a basis of cerebral histopathology and findings in the cerebrospinal fluid, to see if they do not represent masked attacks of epidemic encephalitis.(3)

Three of our patients died, but in only one were we able to obtain an autopsy. In this case the gross findings were fairly typical of encephalitis lethargica. Unfortunately permission was not granted for the removal of any tissues from the body, even for microscopical examination. The neurological signs were quite varied and a divergent squint was found in three of the four cases. Transitory tremors and jerky movements of the extremities were observed in a like number. All showed a leucocytosis varying from 10,000 to 30,000. The sugar content was increased in the cerebrospinal fluids of all the patients and the colloidal gold reaction showed the usual range of variation found in this disease.(2) Xanthochromia was present in one case. The Wassermann reaction of the blood and cerebrospinal fluid was consistently negative.

SUMMARY

1. Four cases of epidemic encephalitis are here reported in which a psychosis was the earliest clinical picture while the neurological signs developed later.

2. Epidemic encephalitis may at the onset present signs of an organic delirium, while on the other hand it may closely resemble a functional psychosis.

3. It is suggested that a thorough review of some of the early histories of atypical cases of schizophrenia or affective disorders may reveal a previous encephalitis.

Case No. 21788. E. N. Male. Age 27. Married. Carpenter. Admitted April 14, 1924. The patient was an efficient, industrious young man who, a few weeks before admission, contracted to supervise an important piece of construction. On April 12, 1924, he suddenly woke

up in the middle of the night and his wife heard him say, "Do you know who I am? I am God." He talked to himself for about two hours and then fell asleep. The following morning he went to his place of work, but returned home shortly afterward and went to bed. He carried on conversations with imaginary persons and, when a physician came to see him, he said he would be glad to go to the Psychopathic Hospital.

On admission he was extremely restless, talkative, excited, resistive; and a cursory physical examination did not reveal anything of importance. A more thorough physical examination, two days after admission, was essentially negative. Both were rather unsatisfactory on account of the excitement and resistiveness of the patient.

On mental examination he was extremely overactive, excited, restless, and shouted at the top of his voice. Sedatives had to be given to secure sleep. There was also very marked push of speech with punning and rhyming. The flow of thought showed marked distractibility, with certain topics brought up to the surface from time to time. He did not answer any questions regarding his intellectual functions; it appeared as if he were somewhat confused.

On admission his temperature was normal; neither urine nor blood count could be secured at that time. He was extremely overactive for about a week until, on April 21st, the pulse became rapid and thready, and he suddenly collapsed; before this it was noted that he was definitely delirious and confused. The leucocyte count of April 22d was 24,000, and on April 24th it was 25,000 with 86 per cent polymorphonuclears. The physical examination was negative. The medical consultant suggested that exhaustion was due to overactivity and dehydration. On April 23d the patient began to vomit food. Neurological examination, including that of the fundi, was negative. On April 24th the patient developed a slight oozing of blood from the right ear. The otological consultant found a small perforation and congestion of the right drum. The X-rays of the skull did not show any evidence of fracture. The patient was given 500 c. c. of 10 per cent glucose solution intravenously and 70 minutes afterwards a lumbar puncture was done. The following data were obtained from examination of the spinal fluid: lymphocytes 2, albumin 1, globulin 1, sugar 172; colloidal gold-sol reaction negative. Examination of a catheterized specimen of urine showed a trace of albumin; specific gravity 1.028, many granular and hyaline casts.

The neurological examination showed a very slow plantar flexion of the right foot as compared with the left and some tendency toward fanning.

On April 25th the patient began to take fluids freely and he appeared very toxic. On April 26th another spinal puncture was done and, although no intravenous glucose had been given previously, the sugar content of the fluid was 236. The same day the patient became comatose and died late at night.

Case No. 21234. E. R. P. Male. Age forty-two. Married. Department manager. Admitted December 28, 1923. This patient was admitted to the hospital because he had suddenly become violent at his office and his speech had become rambling. His mother is supposed to have had senile dementia for some years previous to her death at the age of seventy-six. He was a man of unlimited ambition who worked very hard and took infrequent vacations. He had a large circle of friends by whom he was well liked and highly respected. Three weeks before the onset of his illness he developed a severe furuncle on the back of the neck, for which he took vaccine treatment, the last injection being given a few days before admission. A week later he attended a meeting out of town, at which he received an important promotion and an appreciable increase in salary. On his return to his home it was noticed that he seemed to be tireless and his energy and enthusiasm were extreme. One night he had an appointment with his wife for dinner and the theatre. When she arrived at his office to meet him she found him in a state of extreme excitement, and it was with difficulty that he was quieted and brought to the hospital.

On admission he showed a marked psychomotor restlessness and excitement with constant wild gesticulations. He exhibited flight of ideas, distractibility and incoherence in his speech, which was at times rhyming and fragmentary. His mood was usually one of exaltation while occasionally he seemed perplexed and anxious. He appeared to be in extremely good spirits. Physical examination, so far as it could be carried out in his excited state, was practically negative with the exception of a slight pharyngitis. His temperature was above normal on admission and remained so for several weeks, reaching at one time as high as 103°. He had also a leucocytosis which persisted for a long time and varied between 10,000 and 18,000. The cerebrospinal fluid which was examined on several occasions (fig. 1), showed an increase in albumin, globulin and sugar, but a normal number of cells. On three examinations there was no reduction of colloidal gold, while on three others there was reduction in the middle tubes. On two occasions the fluid was xanthochromic. The blood and spinal fluid Wassermanns were repeatedly negative. Numerous other special examinations were carried out on the body fluids, but all were essentially negative.

The patient remained in the hospital for four months, during which he continued to show his maniacal symptoms. Frequently he would have short lucid intervals during which he would converse intelligibly with his attendants. During the early part of his illness he developed external strabismus of each eye alternately, and this persisted for several days. He had stereotyped movements of the hands of an athetoid or choreic nature. He was finally removed to another hospital. This man, of an extrovertive nature and successful in business, developed a febrile illness the most marked feature of which was a manic state. During the course of it he showed paralyzes of extrinsic muscles of the eyes and athetoid

or choreic movements. He had a leucocytosis and findings in the spinal fluid common in encephalitis.

FIGURE I

CEREBROSPINAL FLUID—E. R. P.—CASE No. 21234								
Date	Appearance	Alb.	Glob.	Cells	Sugar	Gold sol.	Wass.	Culture
1- 8-24		4+	4+		.208	negative	neg.	
1- 9-24					.139		neg.	
1-10-24	yellow	4+	4+	7		0005540000	neg.	
1-11-24	yellow	4+	4+	4		0001111110	neg.	neg.
1-14-24		3+	1+	3		negative	neg.	
1-18-24		2+	1+	4		negative		
1-24-24		4+	4+	2		0122220000		

Case No. 21745. E. E. Female. Age thirty-seven. Married. Housewife. Admitted April 7, 1924. This patient was admitted because she refused to eat her food, felt that she was going to die and had written farewell letters to her children. She had been resistive, screaming and noisy. Her family history contained no information of importance. The patient's early life had been normal and she had married at the age of eighteen. She had three children, two of whom were alive and well at the time of her admission. About three years before she had had a febrile illness which was followed by choreiform movements for a year and a half. She had always been a cheerful, but shy and reserved woman, who had no particular interests outside her own home.

Previous to the onset of the present illness her mother had undergone a serious operation and the patient had been quite worried and nervous. Two weeks before admission she telephoned her husband and said "I have no strength left, I have an awful feeling." From that time she had seemed depressed and had been unwilling to do anything, even to arise in the morning. She expressed the idea that she had contracted ether pneumonia during a visit to her mother in the hospital. One day she seemed to return to a normal state and started her housework, but in the middle of her tasks she suddenly stopped and screamed. She did not care to talk or discuss her condition, but when aroused to speech she was quite rational and coherent. When she started to call her child who had been dead for fifteen years, and speak of people whom she had known years before, she was sent to this hospital. For four days previous to admission she had not been sleeping.

On entrance to the hospital she was over nourished and had a toxic appearance. There was slight external strabismus of the right eye but no other objective signs of organic neurological disease. Her blood pressure was 142-96. She was confused and wandered about her room in a dazed fashion. She seemed under tension and was mute except for occasional cries. Later she spoke of air being pumped into her lungs and of a strange feeling in her back. She was underactive and disoriented. She was admitted with a rectal temperature of 100° which gradually rose, during the eighteen days which preceded her death, to 107°. Her pulse rate varied from 100 to 160 and her respirations from

30 to 50. Her white blood count ranged between 11,000 and 29,000, and rose to 47,000 just before death. The cerebrospinal fluid on five examinations was negative, with the exception of the sugar content, which varied from .084 to .140. Numerous other special examinations, including those on kidney function, showed nothing pathological.

Throughout her stay in the hospital she had to be tube fed and she thought her food was poisoned. She exhibited rhythmic movements of the abdominal muscles at the end of each inspiration, and later, marked tremor and jerky movements of the hands, more pronounced on the right side. Her tendon reflexes were more active on the left than on the right. Finally she died from edema of the lungs and cardiac failure. No autopsy was obtained. This woman, of the introverted type, developed signs of a stuporous depression together with an external strabismus of one eye. During her stay in the hospital her tendon jerks were unequal and she developed rhythmical muscular movements. Her spinal fluid contained an excessive amount of sugar on numerous examinations.

Case No. 24147. A. O. Female. Nineteen. Single. Student. Admitted August 24, 1925. The patient who had always been a strong, healthy girl, was preoccupied for a few weeks before admission on account of the departure of her fiance abroad. On August 22, 1925, while in a canoe with her father, she became rigid, stiffened out and tipped over the canoe. It was in a shallow place. She remained stiff and rigid while she was in the water until her father carried her to shore. Suddenly she began to laugh without any reason. She was put to bed and on the following morning she became extremely restless, removed her clothes, and seemed to want to put everything out of her way. She made many irrelevant remarks, gradually grew more and more restless, refused food, and upon the advice of the family physician was brought here.

On admission her temperature was 104.6° F., pulse 140. Physical and neurological examinations were negative with the exception of the pupils, which were dilated and reacted to light through a narrow arc. The white blood count on the day following admission was 19,000. The patient would not remain in bed, was extremely restless, tossed from side to side, threw off the covers; occasionally, when left alone, she would crawl on the floor on her abdomen, and at times would press her face into the corner of her room. She was mute, and did not show any signs of recognition when her relatives came to visit her. Occasionally she would screech in a prolonged, high-pitched voice, while at other times she would laugh. There was a good deal in the behavior of the patient which could be interpreted as a symbolic regression to a more primitive, infantile level. From the day of admission she refused food, and only small quantities of fluids could be forced into her. After a few days tube feedings had to be resorted to, but she vomited most of them. For about a week her condition remained essentially unaltered, and she

looked very well physically. Her temperature varied from normal to 100° F. Lumbar puncture was done on September 2d, the spinal fluid showed no lymphocytes but occasional red blood cells. It contained an excess of globulin and was cloudy, total protein 48 mgms. per 100 c.c., sugar 164 mgms. per 100 c. c., colloidal gold and Wassermann reactions were negative. On the night of September 2d the patient became suddenly weak, the pulse became thready and rapid. Her temperature was 101° F. She was given subpectoral saline infusions, following which the heart action improved. On examination there was noted an external strabismus of the right eye. Patient was in a stupor and could be aroused only with great difficulty. On September 3d she was seen by a medical consultant, who suggested that the poor circulation was due to medullary involvement and not to cardiac insufficiency. The lungs were clear and physical examination was otherwise negative. On neurological examination the only positive finding was a divergent squint. In the afternoon the patient was given three intravenous injections of sodium iodide solution. At night she became somewhat clearer; but the same evening her temperature began to rise very rapidly, reaching 105° F. in the night. On the following morning, September 4th, she died.

An autopsy was done by Dr. Fulstow on the day of death. The permission for the autopsy was given on the condition that none of the organs be removed for sectioning. The pathological findings of importance were as follows:

Eyes: Blue. Pupils measure—right 4 mm., left 6 mm. Calvarium measures frontal 0.5 cm., left temporal 0.4 cm., right temporal 0.4 cm., occipital 0.5 cm. Dura is not adherent to the calvarium. Pia is very edematous. There is a large excess of spinal fluid which comes away when the brain is removed from the skull. Blood vessels over the convex surface are very much injected. Adjoining the longitudinal fissure in the left hemisphere, just 6 cm. from the occipital tip, the pia shows tiny grayish elevations which make the surface appear rough. This holds true to a lesser degree for the left parietal region. Brain weight 1350 grams. Tigge's formula $8 \times 166:1328$. Gain 22 grams. Over the pons there is a small amount of grayish yellow substance which looks like fibrin. Floor of fourth ventricle smooth. Basal vessels are negative. The only thing of note on sectioning of the brain is mottling of the basal ganglia with a yellowish white.

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REMARKS ON ASTEREOGNOSIS *

BY ALFRED GORDON

OF PHILADELPHIA

N. W., male, forty-five years of age, while riding in a street car about two weeks ago, suddenly felt a numbness in his left hand so that he could not button up his overcoat. At the same time he noticed that his face was drawn to the right side. Examination revealed the following symptoms: The power of the left arm and hand is intact, but when asked to extend his fingers, the left hand presents some flexion of the fingers, while on the right side the fingers are fully extended. There is no paralysis as the fingers can move in all directions, but there is a marked awkwardness in the left hand especially for fine acts, such as buttoning or unbuttoning, threading a needle, etc. He is unable to carry out correctly any act in which assistance of the left hand is needed. There is some dysmetria in the left hand which can be seen in the finger-to-nose test. The objective sensibilities present some changes. Touch and pain are preserved. Temperature sense is somewhat altered: When extreme heat and cold are applied to the left hand or forearm, the patient feels them more keenly on the left than on the right side. Tests for deep sensibilities show some slight alterations in the position, so that he cannot always repeat exactly the change of position of the fingers caused by the examiner, also is there some errors in the compass points, when the patient sometimes takes two points for one. All these sensory changes are very slight.

The most pronounced disorder is in the stereognostic sense. The patient makes frequently gross errors in recognizing gross objects and their consistence. Sometimes he is able to name an object but only after a considerable delay. He complains of gross awkwardness and at times of absolute inability to hold objects between his fingers; they drop out of his hand; he has difficulty to tie his scarf, to find a buttonhole in his shirt or coat. The power of the individual segments of the left upper extremity is preserved and the biceps and triceps reflexes are present and normal. The left knee jerk is somewhat increased but equal to the right knee jerk. There is no ankle clonus but the plantar reflex is in extension only with Oppenheim's and Gordon's methods, not with Babinski's method. Sensations in the lower extremities are normal.

Another striking peculiarity in this case is the involvement of the left lower half of the face; it is deviated to the right side. The palsy

* Read and patient exhibited before the Philadelphia Neurological Society March 26, 1926.

is quite pronounced as at first it gives the impression of a peripheral facial palsy. Superficial sensations of the face are slightly diminished. Further examination shows that the cardiac apex is the seventh intercostal space and lies externally of the mamillary line showing a dilatation of the left ventricle. The second aortic sound is markedly accentuated. The urine is normal. The blood Wassermann is negative.

The patient had an identical attack and on the same side six months ago, from which he made a total recovery. Each of these attacks developed suddenly without loss of consciousness and were not preceded by any untoward symptom, such as vertigo or headache.

Discussion. The clinical picture of this case consequently consists of a motor symptom in the form of the left lower facial palsy and of sensory symptom in the form of astereognosis of the left hand. The localization of these two disorders present some difficulty. The character of the sensory disorders, especially the involvement of the deep sensations with predominance of the stereognostic disturbance presupposes a cortical involvement. Had it not been for the involvement of the face, the superior parietal lobule could have been incriminated. The motor involvement of the lower face leads to its localization in the lower portion of the rolandic area. Redlich (1893) and von Monakow (1898) localize disturbances of deep sensations including astereognosis in the lower parietal lobe, especially in the supramarginal gyrus. The largest number of Redlich's cases contained lesions of the ascending parietal convolution especially in its postero-inferior portion. As it is well known, the latter is supplied by the same arterial branch as the supramarginal gyrus. If we are to assume in the present case only one lesion, we must admit that the lower halves of both ascending convolutions are involved. It will explain the lower facial paralysis and according to Redlich's findings also the astereognosis. This consideration opens up the question of the function of both ascending convolutions. While it is true that the modern researches on the architectonic structure of the cells of these two convolutions show a decided difference and consequently point to a difference in function of the latter, nevertheless one cannot avoid referring to Horsley's observation (1909) according to which extirpation of the ascending frontal convolution was followed by a hemiplegia and involvement of the muscular sense, of tactile localization and of stereognostic sense. The present case favors the idea of one lesion involving simultaneously the two lower thirds of both ascending convolutions, namely, the centers of the face and arm. It favors the localization of the center of the deep sensibilities, particularly of astereognosis, either in the ascending parietal or in the supra-

marginal gyrus which is irrigated by the same arterial supply as the ascending parietal. It points to a possible correctness of Redlich's view concerning the localization of astereognosis. At all events one may say that the superior parietal lobule is not the only cortical center for cerebral stereognostic perception. One may, however, also admit that in cases of astereognosis where other portions of the cortex were found involved, the possibility is that the intracortical association fibers connecting the superior parietal lobule with other portions of the cortex may have been affected. From this standpoint the superior parietal lobule remains the chief center for deep sensibilities.

As to the nature of the lesion in this case, in view of the patient's cardiovascular condition, there might have been either an embolic lesion or else an angiospasm. The rapid and total disappearance of the symptoms after the first attack favors the idea of an arterial spasm. The longer duration of the second attack renders the prognosis more guarded. In the *JOURNAL OF NERVOUS AND MENTAL DISEASE* (Aug., 1914) I reported eight such cases with autopsy findings. Each patient had a series of attacks of transient hemiparesis, occurring at different intervals during life. It was noticed that with each subsequent attack the paralytic condition increased and lasted longer so that eventually a permanent hemiplegia became established. It was evident that the intermittent spasmodic contraction of the cerebral blood vessels gradually led to a destruction of the tissue supplied by them through a process of softening.

In the present case we are dealing with a similar condition. The present attack seems to be quite serious in view of its persistence and duration. A softening of the cortical tissue is evidently taking place thus rendering the prognosis unfavorable. The present case leads to a consideration of another special feature. It was pointed out above that astereognosis was pronounced while the position, tactile localization and the compass points sense were slightly disturbed. If a manual recognition of an object and of its consistence is dependent entirely upon the integrity of different modes of sensibilities, deep and superficial, it seems singular that in this case all superficial sensations, namely, touch, pain, and temperature, are all preserved and a few deep sensibilities, such as position and compass sense, are but very slightly involved. The patient makes very few errors and only occasionally in the tactile localization. The present case in which the stereognostic perception is grossly involved, indicates the possibility of the existence of a certain form of astereognosis which is independent from other sensory disturbances. This is the so-called "Asymbolia" of Wernicke and Claparède.

POSTENCEPHALITIC RESPIRATORY DISORDERS
REVIEW OF THE SYNDROMY, CASE REPORTS AND DISCUSSION

BY SMITH ELY JELLIFFE, M.D., PH.D.

OF NEW YORK

(Continued from page 261)

To return to the medullary and higher localization hypotheses one can turn to Turner and Critchley's excellent résumé, as well as Wilson's² study unless a complete review of the entire respiratory mechanism is attempted. This would require a monograph and more knowledge than I could ever hope to acquire.

The earlier students, says Turner and Critchley, following Wilson, place this respiratory center at various locations in the central nervous system.

A rapid glance at the cinematograph reproductions of the respiratory behavior in case II will emphasize the participation of the facial musculature. Hence Wilson's discussion of this aspect of respiratory behavior may be quoted in extenso since it falls in line so neatly with the underlying thesis of this presentation. Wilson writes:

"The physiological association of facial and respiratory musculatures in the expression of emotion scarcely calls for any comment, so obvious is it. Bell called the seventh the 'facial nerve of respiration'; when the lower face (mouth and nose) is paralyzed it was described by him as 'paralysis of the respiratory functions of the facial.' The implication of the face in sneezing, the facial spasms occurring with respiratory 'gasps' *in extremis*, the collaboration of the facial apparatus with the other in ordinary breathing and speaking are simple instances of the action of this important synkinesis. The seventh nerve is united functionally with the tenth, and also on occasion with the eleventh and certain upper cervical spinal groups. For simplicity's sake, we may allude to it as the faciorespiratory mechanism. We note that its normal activities are involuntary, *i.e.*, it is under voluntary control only to a limited extent.

"The localization of the 'noeud' of this mechanism is still uncertain; we have to postulate a center linking the seventh nucleus in the pons with the motor nucleus of the tenth (nucleus ambiguus)

² Wilson, S. A. K. Pathological Laughing and Crying. Jour. Neur. & Psychopath., 4, 1924, 299.

in the medulla and the phrenic nuclei (see Gamble study already alluded to) in the upper cervical cord, etc. By all analogies this 'center' must be supranuclear; for the sake of argument we may suppose it has an upper pontine site.

"Our second preliminary consideration is to bear in mind the existence and function of the respiratory centers proper for ordinary automatic breathing, situated in the medulla. With normal action must also be associated coöperation on the part of the larynx and the face, otherwise normal breathing might partake of the noisy character observed in various diseased conditions.

"The most recent work on the localization of the respiratory centers is that of Lumsden, who has shown, by numerous experiments on cats, rabbits, dogs and monkeys, the somewhat elaborate nature of the arrangements. Thus, he has demonstrated that ordinary rhythmical respiration—quiet, unconscious breathing—depends on several factors. There is (a) an inspiratory mechanism at the level of the striae acousticae; this he calls the 'apneustic center' because when this group of nerve cells is cut off from above, prolonged tonic contraction of the inspiratory muscles ensues ('apeusis'). The level of the striae acousticae is upper medullary. (b) Just below this there is a separate expiratory center (medullary); the existence of which has long been suspected and is now apparently established. (c) Both (a) and (b) are controlled by a higher center in the upper half of the pons, styled by Lumsden the 'pneumotaxic' center, because it regulated normal quiet breathing. When it is cut off from (a) by appropriate section, respiration takes the form of a series of prolonged inspirations, each followed by two or three relatively quick respirations of abnormal type. Lumsden has shown that this cycle repeats itself with great regularity. Evidently then, the pneumotaxic center produces normal respiration by inhibiting the activity of the apneustic center below (behind) it. (d) A fourth, 'gasping' center, situated below (b) at the level of the apex of the calamus scriptorius, is regarded by Lumsden as a 'relic,' and need not further concern us. (But it does concern the postencephalitic who works with 'relics,' through regression of function to low level.)

"Our next consideration bears on the influence of voluntary action on the respiratory center in the pontomedullary apparatus. Its automatic activity is set aside voluntarily when we deliberately hold our breath, or when we voluntarily pant, cough, yawn, sigh, take deep breaths, etc. Further, its activity is set aside involuntarily when we are convulsed with laughter, or when we give way to crying, sobbing, howling. Both in the former and the latter case facial move-

ment is involved; we innervate the facial musculature voluntarily for the purposes specified, and the face takes its share in the involuntary expression of joy or sorrow.

"Thus we get the idea of a double control over the faciorespiratory synkinesis: (a) a voluntary control when we choose to inhibit automatic movement, and (b) an involuntary control when that automatic movement is forced to give way to the expression of emotion.

"(1) *Voluntary Control*. The path followed by volitional impulses to facial and respiratory muscles is undoubtedly the familiar corticopontine, corticobulbar, and corticospinal tract. In particular, the geniculate bundle of the pyramidal tract, from the operculum and lower end of the precentral gyrus, via the genu of the internal capsule, conveys these impulses to the appropriate nuclei. As we have seen, voluntary breathing sets aside ordinary breathing, hence we must postulate, on the principle of reciprocal innervation, a synchronous inhibition of the automatic pontobulbar center. The anatomical course taken by the latter, inhibitory, impulses is less certain, but of their reality there can be no question. It will be remembered that Hughlings Jackson explained the interesting observation he made on respiratory movement in hemiplegia by the existence of double sets of respiratory fibers passing from the brain in this way.

"Lesions, therefore, of the geniculate bundle anywhere in its course especially if they are bilateral—will impair volitional control over the musculatures concerned in the expression of emotion, with the result that the involuntary action of the same mechanisms will tend to become abnormal. Pseudobulbar paralysis is the disease of the geniculate bundles which, we have already seen, is particularly prone to be accompanied by the phenomena of *rire et pleurer spasmodiques*.

"It is clear, then, that the more absolute the faciorespiratory paralysis, the more exaggerated is the involuntary innervation of the same mechanism. In this connection Monrad-Krohn has shown that the emotional innervation is often distinctly exaggerated on the paretic side in hemiplegia, and has proved (by the 'slow-motion' cinematographic camera) that emotional movement is actually quicker on the side showing voluntary paresis. On the other hand, for the exhibition of 'uncontrollable' laughter or tears a degree of volitional paresis or paralysis is not quite essential, though it is certainly usual; the involuntary action of a normal laugh may break down normal control; the quivering lip of the child is indicative of a balance be-

tween the action of the voluntary and the involuntary processes which may be tipped over in either direction by a trifle.

“(2) *Involuntary Control.* The careful experiments of W. G. Spencer, in 1894, determined the existence of four paths from the cerebral cortex to the respiratory mechanism. Of these, one is undoubtedly the voluntary path just mentioned, from the motor cortex via the genu of the capsule; its stimulation produces, in the ape, a sort of ‘holding the breath,’ or, as Spencer calls it, ‘over-inspiratory tonus.’ Two of the other tracts follow an entirely different course; one is an ‘arresting’ and the other an ‘accelerating’ path. The former arises from the under surface of the frontal lobe, the latter from the sensory cortex. Spencer has traced the two throughout their course; they come together towards the middle line at the mesial aspect of the lower optic thalamus, bordering on the third ventricle, and run down, near the midline of the tegmentum, to the medulla. Both are far removed from the voluntary tract for respiratory innervation in the capsule and crus. More exactly, the route followed by the arresting path is from a spot on the under surface of the frontal lobe where the olfactory tract runs into the temporo-sphenoidal lobe, along the ‘olfactory limb’ of the anterior commissure (where it decussates), by the side of the infundibulum, past the nucleus ruber below and external to the aqueduct in the plane of exit of the third nerve, and so to the medulla. As for acceleration, ‘commencing especially from a point on the convex surface of the cortex within the sensorimotor area, the effect may be followed back through the lenticular nucleus where it borders on the outer and ventral portion of the internal capsule; the strand runs at first externally and then ventrally to the motor portion of the internal capsule, and so reaches the tegmentum. The lines from the two sides meet in the interpeduncular grey matter at the level of and just behind the plane of the third nerves.’”

Wilson believes it is a feasible speculation that these are the paths for emotional activation of the faciorespiratory mechanism. They are separate from the paths for voluntary control; they come towards the midline in the regio subthalamica and tegmentum; stimulation of them produces unvaryingly the phenomena of arrest and acceleration noted above. As far as the respiratory element in involuntary laughing and crying is concerned their appropriate excitation and inhibition will explain the mainly expiratory character of the former and the mainly inspiratory character of the latter.

Wilson's general conclusion may be couched in the following

terms: "There are corticifugal paths to the faciorespiratory centers in the pons and medulla that are independent of the voluntary cortico-ponto-bulbar tracts to the same nuclei; on excitation they will either arrest or accelerate, *i.e.*, interfere with, the normal rhythmic activity of the respiratory center; the available evidence warrants the speculation that they are the routes taken by emotional impulses to modify the faciorespiratory synkinesis in the direction either of laughter or the reverse. Their exact course remains for further substantiation; it is perhaps noteworthy that they make their way separately towards the midline skirting the lower optic thalamus (in the case of one) and passing by the lower regio subthalamica to the tegmentum, and so to more caudal levels of the neuraxis."

Wilson is of the opinion there is more to be said for the participation of the cortex in the production of abnormal emotional activity. "We cannot take it that the cortical origins of the arresting and accelerating respiratory tracts of Spencer are physiologically, though anatomically, separate, and we may ask—using Mills' expression—where is the rendezvous? In an ingeniously developed argument, that veteran neurologist contends that in the right hemisphere, mainly, in the midfrontal region, are centers for the representation of movements especially concerned with the expression of emotion. He gives the term 'movement' a broad significance, as applying both to skeletal and to visceral, vascular, and secretory activity. On the other hand, Bianchi, whose claim to speak with authority also is acknowledged, declares that 'to maintain that the frontal lobe plays a part in the essence and mechanism of the emotions . . . is a bold hypothesis in which there is a good deal of mere conjecture and certainly no basis of proof.'

"Be all this as it may, and however much in the matter is still obscure, our facts have led us to suggest that there are corticifugal paths for the expression of the emotions via the faciorespiratory apparatus, distinct from those for voluntary innervation of the same nuclei, and as necessary corollary we presume the existence of a cortical nodal point coördinating them. Its situation is at present indeterminate, yet it is likely to have some definite position." In this connection Wilson echoes with approval the works of Mills, who declares he is not one of those who believe that the problem of emotion, or of any other great mental process, is to be explained by regarding it in some vague way as a complex expression of the action of the cerebral cortex as a whole.

"There is clinicopathological, and experimental, evidence suggesting that nonvolitional control over the normal activity of the

faciorespiratory mechanism is exercised from the cortex by routes that pass separately downwards to come together towards the midline in the regio subthalamica and tegmentum. It is not certain that these actually pass through the thalamus in man, though it is understandable that some thalamic lesions may be so placed in that ganglion as to interfere with them as a vicinity effect.

"We have no information as yet to show these paths are interrupted by a thalamic relay, nor is it known that emotional impulses can pass from sensory to motor side at this level; it is possible, perhaps, but not probable."

Inasmuch as practically every observer has called attention to the fact that under certain situations of attention distraction this breathing behavior is partly or entirely overcome; and under certain emotional stimuli it may be made worse; and further that in practically all cases the disordered breathing behavior ceases during sleep, it is fairly certain that bulbar implications alone do not offer a complete answer looking toward an elucidation of the syndromy under consideration.

When one reflects for a moment upon the phyletic history of the gradual integration of speech into the respiratory mechanism and when one studies ontogenetically the respiratory behavior from the initial cry of the child at birth up through its evolution into the dynamic utilization of speech symbols as expressive of its life's patterns and purposeful actions socially expressed, it seems quite evident that a purely medullary structural blocking is entirely inadequate to explain the situation. As Turner and Critchley have emphasized, and Wilson shown, and others also indicated, higher pathways, not only of value for respiration per se must be studied, but the respiratory syndromy must be viewed in the light of these higher socially purposeful symbolic activities.

Here it will be apparent to all students of the problems of behavior disorders in encephalitis that one enters upon an enormous terrain. The lines of inquiry spread out in every direction. They become pluri-dimensional and almost infinite.

Inasmuch as the more astute as well as the more superficial students have called attention to the "emotional" situation, the latter being satisfied with the word "hysteria," the former not satisfied with an etymological resting place but insistent upon deeper correlations between structure and function—witness Vogt's suggestions in the "Heidelberg" paper as to the subtle relations of so-called "hysteria" to striatal pathology, a certain sketchy following out of a few of these lines may not be without value.

I once observed an interesting respiratory syndrome in a pharmacist, 23 years of age. He came to the Post Graduate Hospital Clinic "barking like a dog." His bark was a dramatic performance. It had gradually developed over a period of some 2-3 years. Nothing short of a phonograph record could portray the sounds he emitted. They appeared in compulsory episodes lasting from 5 to 30 minutes.

Conceiving the possibility that what I heard at the time was a condensation product, I inquired whether if previously the sounds had been as they were at the time observed. No! they had been more elaborate the previous year but phonetically still unrecognizable. Pushing the history a step further backward a phonetic semblance to recognized vocables became recognizable and then still further back it was plain he was saying—a year earlier—half aloud and half to himself—"No I won't!—No I won't!—No I won't!" and then further back at the beginning of his difficulty the actual verbal formula was recalled. "No, I won't masturbate." Thus in the space of two and a half years—an original statement "No, I won't masturbate," became by gradual condensation the "dog-like bark" heard in the clinic. Naturally this was not all learned in an hour, nor in less than a dozen hours of careful and detailed study, not only of conscious but of unconscious material.

This observation might not seem pertinent but those interested need but read Runge's (l.c.) very carefully detailed report of an encephalitic respiratory syndrome, which he studied by the hypnotic method, to see that Runge came to the conclusion that the respiratory behavior was a representation of what he terms a "larvated masturbation."

Personally, I believe Runge is correct, but also I think that further study would have shown it was more than that, as a psychoanalytic study of both cases here presented shows that the displaced masturbatory craving was but a part of the respiratory syndrome. The report of Case I—already indicated in the earlier pages of this study—gives some of the evidence showing that such a *displacement* of energy from the genital to the respiratory area was present and that other ontogenetic sexual stages were represented, even to well defined incest wishes. A well defined brother incest wish was evident in the unconscious of Case II. It appeared in the very first dream related as will be discussed.

Then to follow out another line not quite so well known in contemporary neurological literature, but almost a commonplace in psychoanalytic literature, the problem of "obscene language" as a *displacement* mechanism from "anal erotism" comes up for investigation.

Abraham, Ferenczi, Jones and others have analyzed the situation in full, as a contribution to character formation. Case I was exceedingly profane and obscene in the earlier months of his illness (see

Burr's comments concerning "degeneracy" of this case). Scores of reports are available concerning this "obscene" language behavior in the "psychotic" reactions of the encephalitic, particularly in the "schizoid" types, where the analogies to schizophrenic obscenities are obvious. Many of the nose grimaces seen and sundry obscene words heard in Case I were loosened bits of early and anal-erotic functioning pried apart from an integrated personality by the encephalitic process and through diaschisis came into pantomimic expression, passing the broken down Super Ego (censor) mechanism probably through cortical blocking from some organic substratum. In so far as recovery took place it was evident that the blocking was partial and not global and a resynthesis of the so-called "normal" personality emerged. Here we may make a concession to Hollingworth's utilization of Hebart's term "redintegration" to define a phase of the recovery process. Thus the patient could now utilize a symbol of "smearing" an enemy, in much the same sense as it would be used on the football field when the opponent's attack was "smeared"—without recourse to a less elegant form of expression.

The frequent "nose blocking" in this and other cases is in psychoanalytic terms, possibly referable to "smell" and displaced "anal eroticism."

It would be premature to attempt to postulate here the numerous structural problems which I have thus briefly summarized in other terms. Every student of neurology knows that the original striatum was of olfactory origin. Here, as Kappers and others have pointed out, was the nucleus of the paleoencephalon, which played so marked a rôle in the behavior of the animal phylum before the distance receptors began to accumulate their end stations in the gradually evolving neo-encephalon. How (diaschisis) dissolution of function can reactivate these old mechanisms and thus bring these nose behaviorisms into prominence I shall not attempt to formulate, the problems are too intricate. I shall only state that they are there awaiting analysis in the nasal tics, olfactory hallucinations, food phobias, schizoid oral activities, and possibly some epileptiform associated reactions.

In a communication made before the Research Association of Nervous and Mental Disease in December, 1925, I have discussed at length certain aspects of the similarities and differences between the psychotic manifestations of "post encephalitic" and "schizophrenic" behavior and there called attention more specifically to olfactorally determined bits of conduct along lines paralleled by Sullivan and others who have investigated the "oral erotic" behavior of schizophrenics. My Case II, with her persistent finger sucking difficulties

(lime drops, cigarette smoking, fish mouth lip appositions, etc.), offer material of a less complicated character as data for such investigations. These nasal-oral combinations are primitively associated phyletically, and hence ontogenetically. One need not go into the steadily advancing mass of animal behavior data to show how important these early biological conditionings are. All that can be done at this time is to note their significance as immense fields for study as the monographs of von Kries, Parker, Henning and others indicate. Thus nasal-oral behavior cannot be entirely overlooked since they form such an important part in "respiratory" behavior, seen from the standpoint already brought into the field by Wilson's study, quoting Bell anent the "facial" nerves as an efferent factor in respiratory activity.

Furthermore, whereas this study does not concern itself with the polyuria so frequently observed in the larger group of the encephalitic syndromy a few cases of a "whistling," "hissing" respiratory type of so-called "tic" might be put on record. These were plainly traceable, psychoanalytically, to the urethral-erotic type of diaschitic phenomena. One patient very clearly showed that "whistling" and the wish to urinate were correlated. There was a distinct proportion which could be stated "the more he whistled the less he urinated and the less he could whistle the more the urge to urinate" (running water). Cases of Wimmer and Gabrielle Lévy have already been cited in this connection.

(5, 6, 7.) Thus we are led to the consideration of (5) the broader mechanisms of the emotional releases through the speech mechanism, (6) of the highly complex relationships of visceral component involvements in the encephalitic syndromy and their behavior manifestations, which opens up the enormous territory so actively under investigation by students of the problem of the psyche and the vegetative nervous system (extrapyramidal regions), to mention only Küppers, Hess, Lotmar, and finally (7) of the metapsychological problems investigated by Freud and his school in the formulations of the Super Ego, the Ego and the Id.

It would be presumptuous on my part to claim that the present discussions approached any final statement of these situations. All that I hope to accomplish here will be to offer a glimpse at certain features which are believed to be of service in the accumulation of data looking forward to a better understanding of the subtle, intricate and highly condensed mosaic that make up human behavior, especially as revealed in the disordered state specifically under investigation.

(To be continued)

SOCIETY PROCEEDINGS

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MEETING, MARCH 18, 1926. DONALD GREGG, M.D.,

PRESIDENT, IN THE CHAIR.

EXPERIENCES WITH FEEBLEMINDED PROBLEMS

DR. WILLIAM HEALY

What is feeble-mindedness? It is clear that we can define mental defect according to some arbitrary norm established for certain groups. It must be understood that this is an arbitrary arrangement, as when the intelligence quotient is used, and in any sort of fairness it has to be interpreted differently for different groups because the capacities of different groups vary so much; the results of tests are also affected by educational training to a certain extent. This is notably true of the ordinary age-level tests where the requirements are so largely verbal, and the child from the educated family, as shown by certain special researches, more readily passes certain tests, proving that they are not safe indicators of innate ability. Keeping group norms in mind, we can state that mental defect may be of various grades and also may exist for various special mental capacities. Feeble-mindedness is a matter for arbitrary definition; it implies comparison of one person with others, and a social situation is thus involved. It seems to me that the general feeling among specialists concerning feeble-mindedness is that it would be best to follow, somewhat, the British definition and consider the feeble-minded person as one who, on account of his mental defect which has existed from birth or from an early age, is unable to perform his duties or conduct his affairs as a member of society—in his particular social group. Let this be so, and we still have confronting us the question, Who is committably feeble-minded? In practice one finds that it is desirable to commit for the following reasons: (a) in order to educate as much as possible, sometimes with the idea of later paroling into the community the individual who has been institutionally trained; or (b) the desirability may be protection of the individual; or (c) protection of the community from the individual.

But all through, whether considering mental defect or feeble-mindedness, any good study of defectives leads us to discern the important fact that there are immense differences between them, not only in such matters as auditory memory or visualizing ability, which are of special import for the educationist, but also in the vocational

field, because of the vast differences in language ability, motor skill, mechanical aptitude, musical ability, and, very important, in dynamic qualities. We have published cases illustrating the differences in this matter of forcefulness and energy. We have seen a mentally defective boy, for example, on account of his energy able to get a job much easier than almost any normal boy with whom we have come in contact. Indeed, we are soon led, even in this field, to study characterology and what makes differences in personality traits, even in this simpler group of human beings. In studying their conduct tendencies, we note great variations in insight, quality of mental content, and in ideation. If one undertakes to offer a prognosis concerning mental defectives, one has to take into account all of these factors, as among the normal.

It is clear that in institutions for defectives there is an opportunity for the educational psychologist that has never been utilized. There are splendid chances for making a study of comparative abilities, of the educational possibilities, of special aptitudes, and of the background of personality and character traits, all of which might be of the greatest service for developing our knowledge of the ordinary run of human individuals. Often the best opportunities for gaining knowledge are found through studying simpler organisms in a simple environment, and I believe that this might be the case if much deeper researches were made into the mental life of defectives.

WAVERLEY RESEARCHES IN THE PATHOLOGY OF THE FEEBLEMINDED. INTERIM REPORT ON THE THIRD SERIES OF TEN CASES

DR. OSCAR J. RAEDER

In this series of researches begun by Southard, Fernald, and Taft in 1918 (*Memoirs of the American Academy of Arts and Sciences*, Vol. XIV, No. 11, May, 1918, and *ibid*, Vol. XIV, No. 111, December, 1921), the prime object was to establish a correlation between testable mind and measurable brain and to find preventable causes, disease processes, that formed the basis of retarded and defective mentality. In the second volume, 1921 (cited above), it was shown in a comparison of the mental ages with the pathological conditions (histological and gross) of the first twenty brains studied, that a certain definite correlation existed (Plate XXXII). The obviously pathological brains—cases of arrested development, porencephalic, some microcephalic, and most hydrocephalic—had a lower mental age. The better anatomical specimens at the upper end of the ladder, including more uniform and complex brain patterns, showed consistently higher mental ages. However, there was a wide mid-zone in which marked exceptions occurred. Most striking among these were two cases, viz., Case III, a microcephalic (brain weight 610 grammes) with a mental age estimated at seven years, and Case XIV, a large imbecile (brain weight 1,205 grammes and of a fairly complex pattern), who had a mental age of only 1.3 years. This seems to demonstrate that we are either unable with our present histopatho-

logical and microchemical technique to discover the differences in the quality of the nerve cells, or that some biochemical process similar to that involved when the cretinic dullard is brightened up by thyroid substance may be responsible for the proper functioning of the ganglion cells. But on account of the relatively small number of carefully studied cases in the literature, it seems imperative that a large number of feeble-minded cases with careful and extensive clinico-anatomical observations should be adequately studied and recorded before we can form the above conclusions.

The following is a brief summary of the findings in five of the Third Series:

Case XXII, adult imbecile, mental age seven, brain weight 1,000. Miliary tuberculosis with rare tubercles in the cortex. There was considerable satellitosis and gliosis.

Case XXIV, adult idiot, mental age estimated 1.2, brain weight 1,220. Satellitosis, neuronophagia.

Case XXVII, Mongolian idiot, mental age 2.1, brain weight 1,275. Increased fat deposit in ganglion cells with marked nuclear eccentricity, some heterotopia.

Case XXVIII, nineteen-year-old imbecile, mental age 8.2 years, brain weight 1,385. Many binucleate ganglion cells were found in different areas; also nerve cell sclerosis, pyknosis, and architectural dilapidation.

Case XXX, Cretin, aged thirty-seven, mental age six months by the Stanford scale, brain weight 1,105. Marked richness of ganglion cells (no aplasia), many sclerotic nerve cells. This case seems to uphold the dysfunction theory for some types of feeble-mindedness.

RESEARCHES ON FEEBLEMINDEDNESS

DR. ABRAHAM MYERSON

This is a summary of a research carried on under a grant from the Research Division of the Massachusetts Commission of Mental Diseases, during the years 1924-25, and which is in progress at the present time. The research material was drawn mainly from the population of the Walter E. Fernald School for Feeble-minded at Waverley, Massachusetts, and we have to thank the late Dr. Fernald and his associates for hearty coöperation in the work. The biochemical work was done by Dr. Louis J. Ullian; the statistical analysis of the figures on heredity was carried through by Dr. Henry B. Elkind. Miss Hannah J. Smith did the field work and assisted Dr. Elkind in the statistical analysis. Dr. A. Myerson made physical examinations of the 845 patients involved and in general directed the research.

1. No definition of feeble-mindedness is satisfactory, since the concept is a changing one, and the upper limit which distinguishes it from the low grade normals is, practically speaking, arbitrarily chosen. The classification is in part based on clinical distinctiveness, as the Mongolian idiot; in part upon pathology, as in the case of the Cretins, and the organic brain cases, another group, according to

supposed etiology, as in the case of the so-called congenital syphilitics. With the exception of a few other scattering groups, such as hydrocephalic and microcephalic cases, the bulk of feeble-mindedness is entirely unknown as to etiology, pathology, and therapy. Ordinarily this unclassified group is subdivided into idiot, imbecile, and moron, with arbitrary limits separating one group from another. These terms represent in no sense a biological classification. Cretins, for example, may be either imbeciles or idiots; the same is true of Mongolians; the organic brain cases range through the three groups, and in any family where heredity is involved as a cause or essential condition one may find all three types of the feeble-minded. Therefore these terms, idiot, imbecile, and moron, are merely a convenient form of measurement, help in the institutional care and in provision for the future, but give us no information as to cause or pathology.

Our cases have been grouped under the following headings:

Spastics.	82
Congenital luetics. . . .	69
Cretins.	19
Mongolians.	37
Microcephalics.	17
Hydrocephalics.	9
Unclassified.	612
Total.	845

The term "unclassified" represents, in our study, the cases in which no known pathology, etiology, or specific clinical grouping can be ascertained. As will be seen, this group includes a large number concerning whose etiology "heredity" plays an important rôle in a relatively large percentage of cases.

2. Heredity of feeble-mindedness:

We have limited our study of the heredity of feeble-mindedness to the incidence of mental diseases, epilepsy, and feeble-mindedness in the parents and siblings of the patients involved. We have omitted other pathological traits simply because there is no way of evaluating them, and because their incidence as psychopathic characters is entirely an assumption. Thus, headache, nervousness, criminality, alcoholism, chorea, paralysis, strabismus, and the like polymorphic conditions have not been considered. Furthermore, we have limited ourselves to the parents and siblings because, in the social strata from which most of our patients have been drawn, precise information concerning collaterals and remote ancestors is, practically speaking, valueless. We have felt that we could obtain a certain value for our figures by limiting the field of inquiry. The figures upon which the following conclusions have been made will appear in detail in a forthcoming paper by Drs. Elkind and Myerson. We cite here the conclusions of Dr. H. B. Elkind in respect to the statistical analysis:

"In conclusion, it may be stated that a statistical analysis of the data presented to me for study indicates for, at least, the Walter E. Fernald State School:

"First, that mental diseases and epilepsy bear no definite relationship to feeble-mindedness as to inheritability, except possibly an accidental one; and

"Second, that there appears to be a distinct tendency for the inheritability of feeble-mindedness from feeble-minded parents alone, the trend being almost an incontrovertible one in the case of descent from two feeble-minded parents and quite a distinct trend in the case of descent from a single feeble-minded parent; and

"Third, that it is quite common for one feeble-minded sibling to be born to apparently normal parents."

In addition to this, the reader (Myerson) adds: In the case of the classified groups, spastics, Cretins, Mongolians, etc., with the exception of the syphilitic feeble-minded, there appears to be no relationship to inheritance of any kind; and

Second, that it is in the case of the unclassified group that the inheritance from feeble-minded parents appears very prominently; and

Third, that the syphilitic feeble-minded have about the same incidence of feeble-minded ancestors as do the unclassified feeble-minded. This will be discussed later in relationship to the entire question of syphilis as a cause of feeble-mindedness.

In conclusion, it may be stated that feeble-mindedness, when inherited, appears to have no relationship to anything else except feeble-mindedness; that, therefore, as a biological problem, feeble-mindedness is distinct from the mental diseases and epilepsy.

3. Clinical study of the sporadic Cretins:

a. We have no new physical features to add to the diagnosis of sporadic Cretinism, except that the bridge of the nose of the Cretin appears to be definitely lacking in bone, and is very flexible. This is in striking contrast to the condition, for example, found in the Mongolian idiot and in the normal individual.

b. We find no evidence that sporadic Cretinism is related to heredity, either of endocrinal disorder or in relationship to feeble-mindedness, mental disease, or epilepsy.

c. The spinal fluid of Cretins is entirely negative.

d. We corroborate the findings of other workers that there is a low basal metabolism, and that Cretinism is undoubtedly a deficiency disorder of the thyroid gland.

e. The biochemistry of Cretins presents the following picture: The sugar tolerance is distinctly erratic, in some cases being nearly normal, in others corresponding to a low sugar tolerance, and in still others to a high sugar tolerance. CO_2 combining power is distinctly lower than established normals. There is, perhaps, a slightly increased amount of calcium found in the blood. The hematological picture is frequently that of a moderate secondary anemia.

4. Clinical study of Mongolianism:

a. We have nothing to add to the physical characteristics of the Mongolian.

b. There is no evidence that Mongolianism is in any way related to heredity, either of endocrinal disturbance or in relationship to mental diseases, feeble-mindedness, or epilepsy.

c. While the Mongolian is frequently the last child in a large family, it is about as frequently the first child or the middle child. As far as we can see, there is no real relationship between the order of birth, the age of the mother, or any other such factor in the incidence of Mongolianism.

d. Recently, Jene Vas, in the *Jahrbuch für Kinderheilkunde* (1925, B. 61; h. 1 & 2, page 51), makes the definite statement that Mongolian idiocy directly results from adrenal insufficiency, and gives the following four signs: (1) A low blood pressure; (2) the vasoconstriction or white line of Sergent; (3) slow coagulating time of blood; (4) nondilatation of pupil after use of adrenalin chloride. Repeating his work, we have not been able to corroborate it in any particular. We do not find evidence that Mongolian idiocy is a disorder of the adrenal gland.

e. The Mongolian frequently has chronic infection of ears and nares. It is perhaps in relation to this that one finds a mild secondary anemia quite common among the Mongolians.

f. The biochemistry of the Mongolians is, on the whole, negative. In a few cases there is a little disturbance in sugar tolerance, which, however, did not appear to us to be significant.

5. Clinical study of spastics or organic brain disease:

Of these there was a considerable number at the Waverley School for Feeble-minded. Our own cases gave us no definite information to add to the knowledge of the subject. We find no evidence that mental diseases, feeble-mindedness, or epilepsy is related in any hereditary way to these conditions. The recent literature emphasizes the rôle of birth trauma, and we call especial attention to the recent work done by Ylppö, Sietz, and especially Philip Schwartz, in Germany, and to the recently reported findings in the spinal fluid by Monroe, Falls, and Sharpe in the United States.

We attempted to study from the records of the Boston Children's Hospital the rôle of encephalitis in early childhood in the etiology of feeble-mindedness. We had an insufficient number of cases from which to draw conclusions, and can only state that a very large proportion of the thirty cases were followed by alteration in mentality of a type severe enough to be classed as feeble-mindedness. It is very likely that unsuspected birth trauma and infections of the encephalon occurring early in life account for a good deal of the feeble-mindedness in nonhereditary cases. Biochemically, the spastics are negative.

6. Syphilis as a cause of feeble-mindedness:

In a previous paper, read before this Society, March 19, 1925, we stated that in our opinion the statement in the literature that syphilis caused feeble-mindedness cannot be substantiated. We may qualify this by saying that if it does cause feeble-mindedness it does so only in a very small number of cases. Our reasons for this conclusion are as follows:

First, the amount of syphilis in the schools for the feeble-minded does not exceed what might be expected in children drawn from the social stratum from which these patients come.

Second, the physical examination of the congenital syphilitics in the institution for the feeble-minded does not show any especial clinical

picture, except in the cases where definite neurosyphilis is present, and this is relatively infrequent.

Third, the examination of the spinal fluid is negative in every way, except in a few cases where definite neurosyphilis is present (congenital paresis and congenital tabes).

Fourth, the neuropathological work done on congenital syphilis in the institutions shows a picture not at all like that found in neurosyphilis in general. Anomalies of brain architecture occur, but these occur also in the feeble-minded of nonsyphilitic origin. Except where definite neurosyphilis exists, the picture is not at all characteristic from the standpoint of syphilis.

Fifth, in our sixty-nine cases there was a striking similarity between the heredity of the syphilitic group and the heredity of the unclassified group, namely, that there occurs a large proportion of feeble-mindedness in the parents and siblings of these cases, much larger, for example, than occur in the families of the spastics.

The hereditary picture lends weight to the belief that the syphilitic feeble-minded are not of known etiology, and that the syphilis is merely incidental. It is our belief that syphilis operates on the all or none principle in relationship to the involvement of the brain. Either it is frankly neurosyphilis or it has no relationship to whatever mental disease is present. Biochemically, the syphilitics are negative.

This concludes the work done up to the present time. Details in respect to each subdivision of the subject will appear in separate publications. We state it as our belief that the problem of feeble-mindedness is a problem *sui generis*, and that the subject matter of feeble-mindedness must be broken up into groups, and each clinical group studied intensively as a problem in itself.

Discussion: Dr. G. L. Wallace: I am sure it is impossible for any of us to listen to these papers without being impressed with the importance of the subject matter. A few years ago it would have been very difficult, in fact I think impossible, to get so many angles of the work. Dr. Myerson's paper impressed upon us the way the subject of feeble-mindedness is gradually being elucidated and set in a field by itself. His paper has shown us that it is a subject apart, in a way, from mental diseases. In Dr. Elkind's paper the unclassified group looms up as an extremely important social group. It carries us back a little over the road we have traveled recently of failing properly to emphasize the importance of the hereditary factor in mental deficiency and makes us wonder whether, in these last few years, we have not treated a little lightly that idea to the extent of minimizing the custodial care of the feeble-minded. In the second paper we were impressed with the character of the diversity of that middle group of brains as symbolizing the middle group of the mentally defective, which becomes the real social problem. The lower group as a social problem does not exist, at least in a broad way, neither does the higher group. Dr. Healy's paper deals with the practical side of the work, and I was interested in the statement he made several times of not being able to place cases in the institutions for feeble-minded that he believed should be placed there. Right here

I cannot but ask whether we have not been expanding too much recently the idea of community care to the exclusion of institutional care. When a patient enters an institution we do not want the professional interest to cease. We are using many of the known psychological tests, but they give us very little information from the practical side. What we want is to have some one tell us how to arrive at the goal of determining the dependable class of feeble-minded in a quicker and more direct way. It often takes us years to make this determination. We find in our institution groups testing exactly the same mental age who are wholly dissimilar in their behavior reactions. For instance, we have the honest group with an intelligence quotient of 60 or 70; we also have the dishonest group with the same intelligence quotient. We have the temperamental group with an intelligence quotient of 60 or 70, and we also have the rather stolid, reliable group with an intelligence quotient of 60 or 70. It is our business to ascertain what group is the reliable group; what group is the dependable group; what group is the one that will probably get along all right in the community and be an asset, and what group, of the same mental age level, is going to become a liability. We bring to our aid not only the known psychological methods but also the practical methods of observation as to the way these individuals conduct themselves, and from these methods we get accurate data and make very concise and precise records. We go everywhere that the child goes. We get the reaction from the time the child gets up in the morning, in his classes, industrial activities, in his work about the school; and we observe how he sleeps, whether he has night terrors, whether he sleeps soundly, whether he sleeps with his mouth open, etc. Our institutions are laboratories for studying the children, but we should like to know how to obtain, in a shorter time, the results that we do obtain by long and arduous study.

Dr. Raeder: I have heard what Dr. Myerson has said about syphilis among the feeble-minded, and I do not agree with him. He made the statement that syphilis has nothing to do with feeble-mindedness. I do not think he is right about this. I shall refer to a piece of work I did when I had charge of the syphilis clinic at the Psychopathic Hospital in which we examined 30 children of syphilitic parents. In this series there were two families in each of which there were three or more children. In the first family the first child had positive Wassermann in serum and positive Wassermann in the spinal fluid; the next child had a positive blood and a negative spinal fluid; the third child, the youngest, was negative straight through. Now Dr. Myerson will tell you that their parents may have been feeble-minded, the father or mother, and as a result the children are feeble-minded and just happened to have syphilis. In the next family one of the children was born before the father contracted syphilis, and that child did not have any trace of feeble-mindedness or any signs of syphilis but was a bright, intelligent child of sixteen years. The father came to America and contracted syphilis. His wife came over three or four years later and begat three more children. The first one of these three was Wassermann positive straight through;

the second was sero-positive and negative in the fluid; the third was W. R. negative in the fluid and in blood serum both. Here we have a family in which the first child, born before the father contracted syphilis, was perfectly normal; the next child was distinctly neuro-syphilitic with all positive laboratory findings, and the next one was feeble-minded and showed a W. R. positive in the blood though the spinal fluid was negative. This shows the attenuation of the virus by repeated pregnancies. Another question arises, How many of all the feeble-minded children are in institutions for feeble-minded? There were not more than one or two of these cases we studied in institutions for the feeble-minded. Most of the families keep their children at home as long as they can, and only when forced put them in institutions. It is also well known that in children who have positive Wassermann early in life there is a tendency for it to become negative as they grow older, so that older residents in institutions for feeble-minded will show fewer positive Wassermann reactions than younger children who are at home. In Germany Weygandt and others who have studied this question find that if they take institutional cases under ten years of age the number of positive Wassermanns is proportionately higher than if they take the Wassermann test on older feeble-minded; 12 per cent and 14 per cent is common with these authors. Therefore, I believe that syphilis does play a rôle in the causation of feeble-mindedness. I believe it is not a large rôle though important and must be considered in any general survey of feeble-mindedness.

Dr. H. B. Elkind: I should like to amplify what Dr. Myerson has said. We employed the statistical method in this study, not for the purpose of induction, but for that of description—to abstract from the material some of the hidden facts and relationships. A small number of the conclusions may have more or less universal application; but most of them are only suggestive. I believe most of them would be verified, if we were able to make a similar analysis of like material from other training schools. We took the families where we had adequate information and divided them into families where there was only one sibling feeble-minded (the patient), into families where there were two (one other beside the patient), into families where there were three (two others beside the patient), etc., and considered these families from the point of view of whether the parents were both feeble-minded or whether one alone was feeble-minded, or both not feeble-minded. In the families where both parents were not feeble-minded, we found that these families showed 84 per cent of them as having only one feeble-minded sibling in a family, while only 11 per cent with parents not feeble-minded showed them to have five or more feeble-minded siblings. On the other hand, when we studied the families where both parents were feeble-minded we found that only 5 per cent of such families had only one feeble-minded sibling in a family, but that 67 per cent or 68 per cent of them showed families where practically all of the siblings were feeble-minded. It seems to me that chance alone cannot explain these results; therefore, they may be considered quite suggestive. I feel, too, that similar studies

obtained from other training schools, such as at Wrentham or Belchertown, would bring forth approximate results similar to those we have presented. Such additional studies are necessary before the conclusions presented in Dr. Myerson's paper may be considered as universal truths, before they can be accepted as possessing universal scientific validity. There is a selective process surrounding admission to training schools; there is no question about that, and our results should be viewed with this fact in mind. However, until one is able to analyze other data which are now becoming available, such as community studies into the extent of feeble-mindedness, I think that conclusions derived from studies of material from training schools will probably give us the best available information concerning the inheritance of feeble-mindedness. I also think that the information which Dr. Myerson has brought before us, that mental disease and epilepsy have nothing to do with the direct causation of feeble-mindedness, has considerable scientific validity to it. Therefore, we may consider feeble-mindedness as a unit character, in no way related to the so-called neuropathic or psychopathic constitution, an assumption utilized by Davenport in his studies on the inheritance of mental disease and defect.

Dr. Myerson: I do not want to be misunderstood regarding the terms idiot, imbecile, and moron. I do not quarrel with these terms as descriptive terms implying the degree of mental deficiency; what I emphasize is that they do not represent biological classification. It is as if tuberculosis were not understood as to etiology and, therefore, tuberculous patients were described as large cavity types, medium cavity types, and small cavity types. Since we have no known etiological or pathological factor in the most of feeble-mindedness we are entitled to the use of the terms idiot, imbecile, and moron, but in using them we must keep strictly in mind that they have no biological, etiological or pathological meaning and represent a measurement of damage. Even as a measurement of damage they are, practically speaking, in one dimension only and give us no fundamental ideas as to feeble-mindedness. In other words, they cannot be used in a paper which tries to be biological in its point of view. The cases Dr. Raeder cited are not of any particular value because the number is too small to prove anything. If only $3\frac{1}{2}$ per cent of a population of over 3,000 is found to have signs of syphilis, there is not much room for the assertion that syphilis in itself causes feeble-mindedness, since coincidence might easily account for that number. Our studies, which include the spinal fluid studies as well as an attempt at thorough clinical and familial investigation, show this at any rate, that syphilis, if it does cause feeble-mindedness, causes it in only very small measure. The question has been raised as to the difference between our results and Dr. Davenport's. Dr. Davenport assumed the Mendelian hypothesis, at least in his earlier writings, and then went ahead to prove the hypothesis. In order to do so, he included everybody in the family, even the most widely separated collaterals, and as pathological characteristics bearing on feeble-mindedness he included things which have no relationship to feeble-mindedness, such as chorea, paralysis,

criminality, nervousness, and the like. Necessarily, if you stretch the limits of the family wide enough, and if you make the types of pathological characteristics very inclusive, you can prove almost anything is Mendelian. You can prove that red hair has something to do with feeble-mindedness. We do not know that the parents or relatives in our cases were feeble-minded. We did not make psychological examinations of them. We judged them by the community evaluation of them, by the family doctor's statement, by the statement of social workers, by their life history, by a dozen and one things which may be wrong. We did the best we could, and confirmed our reports in as many ways as possible. We think we found that a large number of people are feeble-minded who have no heredity to account for it; we think we found that when one parent is feeble-minded, there is an increasing amount of feeble-mindedness in the descendants, and when both parents are feeble-minded, there is a tremendous amount of feeble-mindedness in the descendants. Dr. Elkind tends, on the whole, to interpret this as showing some degree of Mendelianism in the hereditary cases. There I differ with him. No matter what type of heredity is involved one would expect more feeble-mindedness where both parents are defective than if only one parent were. Assuming blastophoria, if the germplasm is injured on both sides, you ought to get feeble-mindedness. The hypothesis which I am now trying to prove is that the involvement by some environmental force injured the germplasm. What that environmental force may be is utterly beyond my conjecture at the present time.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Lange, F. PATHOLOGY OF ARTERIES, WITH SPECIAL REFERENCE TO ARTERIOSCLEROSIS. [Virchow's Arch. f. path. Anat., etc., CCXLVIII, 463.]

In this article a somewhat novel view is advanced of the origin of structural changes in the arteries. It is, briefly, that such changes are caused by nutritional disturbances in the vessel wall occasioned by stimulation of their nervous supply. The argument is developed in three stages by the consideration of (1) the anatomy and physiology of arterial nutrition, (2) the experimental pathology of the arteries, and (3) the application of the conclusions arrived at to human arterial pathology.

From a review of the known facts of anatomy of the arteries and of the pathological changes occurring in such conditions as dissecting aneurysm, periarteritis nodosa, tubercle, and syphilis, the first conclusion is reached that the arterial wall is nourished by both the blood circulating within the lumen and by that carried to it by the vasa vasorum—the intima and greater part of the media being nourished from the lumen and the adventitia from its vasa propria. When the latter supply is wanting, nourishment is obtained from the fluids of the surrounding tissues. Certain experimental evidence is brought forward in support of this—for example, the changes occurring in the vessel wall when the supply through the vasa vasorum is cut off by operative procedures.

The second stage of the argument consists chiefly of evidence derived from experiments on the effect on arteries of the administration of adrenalin both locally and into the general circulation. In keeping with earlier work, the prolonged intravenous injection of large doses of adrenalin is found to cause medial necrosis with or without intimal proliferation, intimal proliferation without gross medial change, and edema and hemorrhages in the adventitia. These changes, however, are interpreted as being the result not of a direct toxic effect of adrenalin on the tissues, either alone or in combination with raised blood pressure, but of its stimulation of the sympathetic nervous system. It is found that the constrictor effect of adrenalin in low concentration on small arteries and capillaries is replaced at a high concentration by paralysis of the constrictor fibers, resulting in dilatation with slowing of the blood

stream even up to stasis. With the larger arteries also a dilatation can be produced. These effects of adrenalin are said also to be produced by electrical stimulation; for example, stimulation of the carotid artery in this way leads to dilatation of the vessel wall and to the dilatation of, and stasis in, its adventitial vessels. In this dilatation and stasis with their consequent nutritional disturbances the author sees the reason for the medial and intimal changes which are found.

It is from this standpoint that, in the last section of the paper, the various arterial changes occurring in man are passed in review. Hyperplasia and necrosis of collagenous tissue, fatty change, and calcification are all regarded as the expression of a disturbed blood and lymph flow through the vessel wall, resulting from a primary stimulation of their nervous supply. It is difficult to obtain a clear view of the author's ideas regarding the nature of the nervous stimulation. For the aorta and larger arteries a mechanical stimulus, arising, for example, from eddies in the blood stream or from increased blood pressure, is apparently regarded as sufficient explanation. For the rest the cause is seen in the nervous wear and tear of life or in the various intoxications.

O'Hare, J. P., and Walker, W. G. ARTERIOSCLEROSIS AND HYPERTENSION.
[Arch. Int. Med., Vol. XXXIX, March. J. A. M. A.]

Fifty cases of peripheral arteriosclerosis with systolic blood pressures under 145 were studied by O'Hare and Walker. The peripheral sclerosis varied from slight tortuosity or thickening to beading and calcification. More than half of these cases showed almost no sclerosis. From the arrangement of the blood pressures according to an ascending value for the systolic, it was evident that there is no relation between the height of either the systolic or diastolic pressure and the degree of sclerosis. In a second series of 50 cases of peripheral sclerosis with systolic pressures over 145, the degree of peripheral sclerosis averaged somewhat less. The lack of relationship between peripheral and retinal sclerosis was particularly well demonstrated in this group. The authors assert that their findings definitely establish the fact that the peripheral vessels play little or no part in hypertension. They do show, however, a definite relationship between small vessel sclerosis, indicated in the retinal arteries and high blood pressure. Nothing was developed from these observations to prove whether hypertension comes first and sclerosis second, or vice versa.

Ozorio de Almeida, M., and Piéron, H. SKIN AND MUSCULAR TONUS.
[C. R. Soc. Biol., Vol. XCII, May 30.]

Ozorio de Almeida's and Piéron's observations indicate that the muscular tonus depends on the function of the skin in frogs and mammals.

Staemmler, M. VEGETATIVE SYMPATHETIC NERVOUS SYSTEM AND ARTERIOSCLEROSIS. [Ziegler's Beitr. z. path. Anat. u. z. allg. Path., Vol. LXXI, No. 2.]

The author finds that degenerative processes with inflammatory reaction of the vascular connective tissue apparatus are present in the ganglia of the sympathetic in acute infectious diseases and in septic general infections. He reports also chronic, slowly progressing processes which result in the loss of nervous elements with interstitial connective tissue substitution, observed in chronic alcoholism, lead poisoning, etc., as present also with arteriosclerosis. He believes therefore that the disease of the nervous apparatus is the primary one. Bacterial injections in rabbits produced arterial changes which likewise were accompanied by similar disease processes in the sympathetic, while in experimental adrenalin sclerosis there was only a much smaller involvement of the sympathetic ganglia.

Tulgan, L. CARDIAC ACCELERATION IN ABSENCE OF INHIBITORY CENTER. [Am. Jl. Physiology, Vol. LXXIV, March.]

The experiments on cats made by Tulgan show that the increase in heart rate above that of the completely denervated heart cannot be regarded as being due to inhibition of inhibition, but must be due to some accelerator influence. An increase in the heart rate may occur independently of the cardioinhibitory center. Provided the heart is not beating at its physiologically maximum rate, a definite increase in the rate may be obtained by stimulation of an afferent nerve after the vagi have been sectioned. [J. A. M. A.]

Brandenburg, K. PERIARTERIAL SYMPATHECTOMY. [Med. Klin., April 20, Vol. XX.]

Brandenburg reports the results of a collective inquiry among a number of German surgeons. It seems that the majority of patients were benefited for a while by the periarterial sympathectomy. Permanent good results were rare. Patients with sclerotic vessels require especially careful management.

Lehman, E. P., and Callander, C. L. PERI-ARTERIAL SYMPATHECTOMY AND ARTERIAL DECORTICATION. [Ann. Surg., LXXVII, 30, and Ann. Surg., LXXVII, 15. Med. Sc.]

Callander reviews the literature of arterial decortication and gives experience of seven cases in which the operation was performed. The technique of Leriche was followed and the results are compared with those mentioned by that author. The visible contraction of the artery at the site of operation was constantly seen in the case of the brachial artery, but not in the case of the femoral. Post-operative increase of surface temperature was only found in one case, and increase of peripheral blood pressure in the operated zone was never found. Cases operated upon

were classified into three groups. Group I were those cases in which arterial changes at the time of operation were thought to be spastic in nature rather than obliterative. In Group II were cases in whom obliterative arteritis seemed to play a predominant rôle. In Group III was a case of pain in the upper limb for which no cause could be assigned. There were three cases in Group I in which gangrene occurred as the result of the arterial spasm. No improvement in any of them followed decortication. In Group II, where gangrene resulted from an obliterated artery, so that arterial pulsation in the extremities could not be appreciated, there were three cases, two of the lower and one of the upper extremity. Two were unaffected by the operation and the third patient, who had a gangrenous ulcerated area on the dorsum of the little toe, was greatly benefited. The ulcer healed and he has remained well for more than a year. In Group III there was one case where the patient complained of excruciating pain in the hand which had followed an incision of the terminal phalanx of the thumb. The pain was causalgic in character and disappeared after decortication of the brachial artery.

Callander concludes that an insufficient number of observations of this operation has yet been made and it is not even decided whether sympathetic fibers controlling the peripheral vessels are severed in this operation. He points out, however, that great improvement in otherwise hopeless conditions has resulted from the procedure.

Lehman presents experimental results of periarterial sympathectomy in healthy animals. He concludes that it is impossible to reproduce experimentally in dogs the circulatory changes which occur in human beings following the stripping of the main artery to the limb, but that these changes occur in the dog's leg following the removal of the vaso-constrictor fibers running to the hind leg. The suggestion is made that the increase of temperature noted by Leriche is due to a local reaction to operative trauma, for an increase of temperature follows a simple dissection operation without division of the nerves accompanying the artery. By dividing the sympathetic in a rabbit he was able to show that the cicatrization of a wound of the ear was unaffected by the resulting dilatation. [C. A. P.]

Perrin and Yovanovitch. NERVOUS DISTURBANCES IN PULMONARY TUBERCULOSIS. [Paris Méd., Vol. LVI, March 31.]

Perrin and Yovanovitch examined the vegetative nervous system with the usual tests in forty-nine patients with pulmonary tuberculosis. They tried, however, to use a smaller amount of pilocarpin, because the patients were hypersensitive, and distinguish between local and general disturbances of the vegetative nervous system. They found in 15 per cent of the patients an increased tonus of the sympathetic, and in 42 per cent vagotonia. Other patients had a lowered tonus of both systems, especially when the poisoning of the organism was progressing. The thyroid and

suprarenals may be the chief endocrine glands involved. Though these tests cannot be used for remote prognosis, they contribute to show the actual state of the defense of the organism. Increased tonus of the sympathetic system seems to be favorable. Low tonus of the vegetative system is accompanied by an anergic state, and has the same bad significance.

Galup, J. THE OCULOCARDIAC REFLEX. [*Presse Méd.*, Vol. XXXII, June 4.]

Galup produced the oculocardiac reflex in order to examine the disturbances of respiratory organs due to changes in the tonus of the vagus. The investigation showed in 324 cases that the slowing of the pulse rate, which is a normal phenomenon, is more pronounced in chronic respiratory diseases; still more marked in cases with paroxysmal dyspnea, the maximum occurring in essential asthma. His conclusion is that the hyperirritability of the vagus nerve causes not only spasms, but is partly responsible for the dyspnea, catarrh and congestion. Possibly even the chronic character of respiratory diseases is due to the change in the vagus tonus.

Bolten, G. C. TREATMENT OF EXUDATIVE PAROXYSMS. [*Ned. Maand. v. Geneesk.*, 1924. J. A. M. A.]

Bolten presents evidence to confirm the view that a periodical, generally sudden, occurrence to exudates, edema in different organs and tissues, of vasomotor trophic origin, is the explanation of the symptoms from the exudative diathesis in children, urticaria, intermittent effusions in joints, serous meningitis, asthma, genuine epilepsy, migraine and dysmenorrhea, and also for idiosyncrasies to drugs and foods. Notwithstanding the variability of the manifestations, the underlying cause is the same in all, namely, a stimulating influence from the irritated sympathetic system. All the exudative manifestations must be regarded as the reaction of the organism to one or more toxic agents. We know only a few of these toxic agents (those responsible for the idiosyncrasies); the others are probably inadequately catabolized waste products from the food or from cell metabolism. In the overwhelming majority, they are of endogenous origin. Some of the numerous ferments of the lymph and of the intermediate metabolism are substandard, and the resulting disturbances may be of various kinds, and may alternate. No one subject ever presents them all, but persons often have from two to six at a time or in turn, as also the other members of the same or preceding generations. A neuropathic tendency is evident, and the "vegetative stigmata" are common in the families, including the oculocardiac reflex, the drop in blood pressure when the vagus in the neck is compressed, and hypereosinophilia. All these manifestations are traceable to irritation of the sympathetic, and all are benefited by measures which paralyze the sympathetic or stimulate the vagus or both. Bolten agrees with Higier that the

most convincing proof of this is that epinephrin arrests pilocarpin eosinophilia and pilocarpin arrests epinephrin glycosuria. Parenteral protein therapy acts by paralyzing the sympathetic. His experience has confirmed the decline of eosinophilia after injection of epinephrin, while pilocarpin and cholin materially increase the number of eosinophils. In Bolten's patients with hypereosinophilia, the eosinophils returned to normal figures under treatment with epinephrin or thyroid extract. The hypereosinophilia which accompanies urticaria, prurigo, eczema, herpes and psoriasis must be regarded as constitutional, as these syndromes are not "skin diseases" but the manifestation of metabolic disturbances.

Müller, E. F. REGULATION AND SIGNIFICANCE OF TONUS OF BLOOD VESSELS. [Med. Klin., Vol. XIX.]

The influence of intracutaneous injections on the number of leukocytes is here subjected to experimental study. There is demonstrated an intimate relation of the skin to the regulation of blood vessel tone. The dilated abdominal vessels retain or hold the leukocytes. Glaser's explanation of Widal's hemoclastic crisis as resulting from changes in the tonus of the vegetative nervous system seems substantiated. Increased sympathetic tonus minimizes the abdominal leucopenia.

Lintz, W. LACK OF OPERATIVE INDICATIONS IN ALLERGY. [Annals Surgery, Vol LXXI, June. J. A. M. A.]

Lintz asserts that a large number (30.4 per cent) of asthmatics and other allergic patients are operated on, but that most of these operations are needless and useless. Nose and throat operations are the ones most frequently performed. The benefit derived from these operations is negligible and hence they should be abandoned. No operation will cure or even benefit asthma and hay fever.

Greig, J. L. TREATMENT OF MIGRAINE. [Brit. Med. Jl., June 21, 1924. J. A. M. A.]

Greig believes in the gastric theory of migraine, that the condition is due to recurrent attacks of dilatation of the stomach and by means of regulation of the diet endeavors to maintain the stomach in its normal physiologic condition. The results are said to have been most satisfactory. Dilute hydrochloric acid is administered only during the first two weeks of treatment.

Daniélopou, D., and Carniol, A. CARDIAC NERVOUS SYSTEM. [Arch. des Mal. d. Coeur, March, 1923.]

These authors advocate a new method of using atropine as a functional test of the cardiac innervation. Subcutaneous injections have hitherto been given, whereas the intravenous method alone enables one to know the dose which affects the cardiac nervous system and to produce

in almost all cases a complete paralysis of the vagus. Secondly, the marked acceleration of the heart following atropine has been regarded as a sign of vagotonus, whereas in reality the phenomenon indicates a state of sympathicotonus. Moreover, the atropine test has been regarded as a method to be used for the study of the vagus exclusively, whereas it is available for estimating the tonus of both the vagus and sympathetic. Furthermore, it is generally stated that the maximal tachycardia produced by atropine is about 120 in man, whereas it may range within much wider limits which depend upon the tonus of the sympathetic. It may remain below 100 in cases of sympathetic hypotonus, or exceed 150 in cases of sympathetic hypertonus. The test of the upright position (orthostatic test) in association with the atropine test enables an accurate and complete study of the cardiac nervous system to be made and is carried out in the following four stages: (1) Study of orthostatic tachycardia before atropine (vagus intact); (2) action of a small dose of atropine ($\frac{1}{2}$ mg.); (3) determination of the total dose injected intravenously required for complete paralysis of the vagus and of the maximal acceleration thus obtained; (4) study of orthostatic tachycardia after atropine. The two following methods can be used to determine if the paralysis is complete: (1) by injection of atropine in successive doses the total amount of the drug which produces maximum acceleration is determined; (2) when it is established that complete paralysis of the vagus by atropine has been obtained the pulse is counted in the recumbent position and then in the upright position. The subject is then made to lie down again and the pulse is counted again in this position for a few minutes. The upright position produces an immediate acceleration. When the patient lies down again, if the vagus has been completely paralyzed the rhythm gradually returns to its previous rate in the recumbent position, whereas if the paralysis is incomplete the rhythm falls below this rate and shortly afterwards resumes its initial rate. The following information is obtained by the combined use of the atropine and orthostatic tests: (1) The tone of the sympathetic released from its antagonist is determined, being represented by the maximum acceleration obtained in the recumbent position—on the average 116 to 118 beats a minute. (2) The inhibitory power of the vagus is determined by deducting from the maximum rate the number of pulsations before the injection in the same position of dorsal decubitus—about 48 to 58. (3) The total quantity of atropine injected intravenously required for complete paralysis of the vagus—about $1\frac{1}{2}$ mg. (4) The acceleration of the rhythm produced by the upright position while the vagus is intact—80 beats a minute on the average. (5) The acceleration of the rhythm produced by the upright position after complete paralysis of the vagus—about 130–140 beats. (6) The acceleration produced by a small dose of atropine ($\frac{1}{2}$ mg.) incapable of causing complete paralysis of the vagus—about 90 beats.

2. ENDOCRINOPATHIES.

Fruhinsholz, A. THYROPARATHYROID INSUFFICIENCY AND PREGNANCY. [Gyn. et Obstet., Vol. VI, No. 3.]

Cardiovascular renal complications are frequent in pregnancy. Among the etiological factors the author includes mild myxedematous conditions. In his studies the kidneys behave badly in this combination. Eclampsia and slight albuminuria was found in the first case; slight and transient albuminuria in the second; albuminuria and "eclampsism" in the third, and edema in the fourth observation. His aim is to supply a base for obstetricians to study the question anew from fresh observations. He reviews the literature on pregnancies in women with thyroid insufficiency, and raises a number of valuable hypotheses as clues to the solution of some of the as yet unknown problems.

Cannon, W. B., and Smith, E. P. IX. FURTHER EVIDENCE OF NERVOUS CONTROL OF THYROID SECRETION. [Am. J. Physiol., Vol. LX, p. 476. Med. Sc.]

Confirmation of previous work by Cannon and his co-workers that the thyroid is innervated by the sympathetic and that activity of the gland by stimulation of the cervical sympathetic or massage of the gland causes an increased rate of the denervated heart, indicating that the thyroid hormone stimulates the sympathetic. This effect on the heart is slow, requiring from 30 to 60 minutes to appear, and passes off in a similarly slow manner. It differs in that respect from the action of adrenalin and the effect can be produced in the absence of the adrenal glands. Asphyxia and stimulation of afferent nerves produce secretion of the thyroid hormone. In an addendum it is stated that the observation when repeated in March and April gave negative results. This is attributed to the fact that the thyroid at the end of the winter contains a greatly reduced amount of its specific hormone as compared with the summer.

Hildebrand, O. THE RESULTS OF OPERATIVE TREATMENT OF GRAVES' DISEASE. [Deut. med. Woch., Vol. XLIX, March 16, p. 338.]

This surgeon has performed partial resection operation of the thyroid in Graves' disease in 666 instances, with 24 deaths (3.6 per cent). Two hundred and thirty-four of his patients have been followed up and it has been found that 125, or 54 per cent, were cured. By "cure" he means disappearance of tachycardia, tremor, diarrhea, nervous restlessness, and exophthalmos, and recovery of general good health and gain of weight, *i.e.*, the obvious exophthalmic syndrome, but there are no indications of his inquiries going beneath the surface into the psychic life of the individual. Further, this result had been maintained for several years. In 79 cases, or 34.3 per cent, marked improvement was effected, and in 25, or 10 per cent, there was some improvement. Thus altogether in 87 per cent operative treatment was beneficial. But in many cases these benefits

were not obtained until the patient had undergone several operations. General ether anesthesia and local adrenaline-novocain anesthesia have each brought fatalities, and he deplors the fact that there is no sure means of diagnosing a persistent thymus and status thymicolymphaticus before operation. Only the general appearance of the patient may be suspicious, and when a persistent thymus is suspected, he suggests that it is well to treat it by the X-ray before attempting an operation.

McClendon, J. F. PREVENTION OF GOITER. [Science, LVI, 269.]

McClendon emphasizes that the goiter belt seems to be a low iodid belt. It is identical with the mountainous and glaciated regions, where the iodine has been run off into the sea. Practically all the world's supply of iodine is now in the sea, where there is a calculated total of sixty billion metric tons in the form of inorganic salts. The writer, therefore, suggests the prevention of goiter by the use of table salt, made from sea-water, the eating of sea food, and the addition of powdered kelp.

Hartley, J. N. J. ERRORS IN DEVELOPMENT OF THYROID. [Surg. Gyn. & Obst., XXXV, No. 5.]

Thyroglossal sinus, lingual thyroid and thyroglossal cyst are described and discussed in this paper. A lingual thyroid is usually a true ectopia thyroidis and represents the thyroid. The absence of a palpable isthmus in the pretracheal region is strong evidence of such lingual swelling being an ectopic and not an accessory thyroid. When a lingual thyroid gives rise to symptoms demanding surgical intervention, a minimal amount of tissue should be removed, and the surgeon should be prepared to adopt thyroid therapy if the clinical symptoms or the basal metabolism rate indicate a state of hypothyroidism. The so-called "infrahyoid" type of thyroglossal cyst not infrequently has an epithelial prolongation upward, either through, behind or in front of the hyoid bone, and, to insure non-recurrence, it is advisable, when the pedicle can be traced to this bone, to resect the middle portion and to search for a tract leading to the foramen cecum.

de Quervain, F. PROPHYLAXIS OF GOITER. [Schweiz. med. Woch., Vol. LII, No. 35, p. 857.]

This is one of the papers contributed at a joint goiter commission meeting of Swiss scientists. Goiter, he advocates, represents the manner in which the thyroid adapts itself to an inadequate supply of iodine. It gets bigger from straining to work with an inadequate iodine supply in the food. The thyroid is found abnormally large in the infant cadavers in the Swiss goiter centers, and as fully 75 per cent of all the children entering school for the first time at Berne have enlarged thyroids, it is evident that prophylaxis must begin before the school age. It must be begun with the mother, and this is practicable only with iodized salt. The aim must be to prevent goiter in the rising generation. He warns

that the dose of iodine in the salt must be below the dose that is active in adults, also that the school prophylaxis must be kept at the lower limit of effectual action, and that children approaching puberty must be excluded from these prophylactic measures at any signs of even slight overfunctioning of the thyroid.

Bircher, M. E. IODINE PROPHYLAXIS OF GOITER. [Schweiz. med. Woch., Vol. LII, No. 35, p. 862. J. A. M. A.]

Bircher insists that the behavior of the thyroid can be gaged with comparative precision by the basal metabolism. This should be the guide for treatment with iodine. Any exaggeration of the basal metabolism forbids iodine. He has encountered a number of cases of grave injury from iodine treatment without this scientific control. He adds that next spring there is to be a conference on goiter at Basel at which American physicians will take a prominent part. "They are coming to Switzerland," he says, "to study goiter. They have nothing to learn from Swiss physicians in regard to goiter."

Hudson, W. A. THE IODINE CONTENT OF THE BLOOD FOLLOWING THYROIDECTOMY. [The Journal of Experimental Medicine, October, Vol. XXXVI.]

This author first determined the iodine content of the blood of normal dogs kept under laboratory conditions, and then removed the thyroid of these animals in order to determine whether the iodine content of the blood was changed. The lowest amount of iodine found in normal blood was 0.0029 mg., and the highest 0.0145 mg. The average amount of iodine in the blood of seventeen dogs before the removal of the thyroid was 0.0079 mg. After thyroidectomy the iodine content of the blood was increased. A series of experiments was performed to determine the effect of thyroid feeding on the iodine content of the blood of dogs whose thyroids had been removed. Feeding of fresh thyroid of sheep to thyroidectomized dogs reduced the iodine content of the blood so that it approximated the preoperative level. When the feeding was discontinued the iodine content of the blood was again increased.

Achard, C. EXOPHTHALMIC GOITER SYNDROME. [Progrès Médical, Vol. XXXVII, No. 25, p. 289 and others.]

These clinical lectures give a general study of the Basedow's syndrome, with a description of its numerous symptoms, a discussion of its pathogeny, a summary of its treatment and a particular regard to nutrition troubles and relations to endocrinian disturbances, diabetes and glycolytic insufficiency. Several cases of patients are reported in the course of these lectures. The glycolytic insufficiency, detected by alimentary glycosuria, alimentary hyperglycemia, alimentary increase of carbon dioxide in expired air, is not at all as a rule and is often quite failing, so that it must not be included among the elements of the Basedow's syndrome. When

it is stated, it is an associated trouble of the nutrition which does not directly depend on the thyroid. So it is conceivable that it may be met with sometimes even in the hypothyroidism.

The pharmacodynamic tests: Goetsch's test with adrenalin, Claude's test with pituitrin, Bram's test with quinin, give very inconstant results.

In the pathogenic discussion are pointed out two chief features: excitation of the cervical sympathetic (sympathicotony) and hyperthyroidism. The author believes that hyperthyroidism is the primitive fact, and that the sympathetic excitation is not the same in all the parts of this nervous department, because the excitability is not everywhere the same. As an instance of that, he refers cases of asymmetric symptoms in Basedow's disease. Namely, a woman had on the right side a much prevalent exophthalmus, an hypertrophy of the facial bones, and an hypertrophy of the breast. Besides she had a vasomotor disturbance localized to the right upper limb. It is conceivable that the exciting substance of endocrinian origin being the same in the whole circulation, the diversity of the reactions may be attributed to an unequal excitability of the vegetative nervous system. That and the association of interreactional troubles of other endocrinian glands than the thyroid may explain the great variety of the symptoms in Basedow's disease and the coincident meeting of sympathicotonic and vagotonic troubles. [Author's abstract.]

Taylor, J. G. GOITER DISTRIBUTION. [Wisconsin Med. Journ., XXI, No. 5.]

This exhaustive study of the distribution of simple goiter in school girls is derived from an examination of 1,425 students ranging from twelve to twenty-two years of age. Slight tremor and tachycardia were present in 27 per cent of the cases; a mild exophthalmus in 0.8 per cent. In 7.7 per cent the right side and in 2.8 per cent the left side were affected. The whole gland was implicated in 40 per cent and the isthmus alone in 52 per cent. Thirty-seven per cent of the students coming from Wisconsin had enlarged thyroid. Among students coming from other states the percentage incidence was: Missouri, 36; Michigan, 34; Minnesota, 32; Indiana and Illinois, 30; Iowa, 27; Arizona and Nebraska, 25; Ohio, 22; South Dakota, 20; North Dakota, 17; Tennessee, 12; Mississippi and Montana, 10; Pennsylvania, 8, and Colorado, 7. Students from Alabama, Kansas, Kentucky, Massachusetts, New Hampshire, New Mexico and Texas, were all free from goiter disturbances in this enumeration.

van Dyke, H. B. DISTRIBUTION OF IODIN IN THYROID. [Journ. of Biol. Chem., LIV, No. 1. J. A. M. A.]

The findings of Marine, Feiss and Rogoff previously made that the hyperplastic thyroid gland of the dog rapidly binds iodine intravenously introduced as a solution of potassium iodide were confirmed by van Dyke. By a method already described the ratio value of iodine in cells to iodine in whole gland was determined and found to be very low after the

intravenous injection of potassium iodid solution into dogs with hyperplastic glands when those glands were removed from 1.5 to 60 minutes after the injection. The ratio value more nearly approached the normal if the interval elapsing between injection and removal of gland was made about twenty-four hours instead of one hour or less as in most of the experiments. When iodine as colloid iodine solution of normal animals was administered intravenously practically none of the colloid iodine was taken up by hyperplastic glands during the periods of time used in these experiments; yet from an injection of a comparable amount of iodine in the form of potassium iodid the ready binding of iodine by similarly hyperplastic glands was proved. Colloid iodine of hyperplastic glands removed one hour after the intravenous injection of potassium iodid solution was taken up to some extent by hyperplastic glands; but these last named glands bound additional iodine as potassium iodid introduced after the colloid iodine injection.

Hammett, F. S. A DIFFERENTIAL EFFECT OF THYRO-PARATHYROIDECTOMY AND PARATHYROIDECTOMY ON THE INCISOR TEETH OF THE ALBINO RAT. [Am. J. Physiol., LXII, 197.]

In rats parathyroid deprivation produces definite defects in the incisor teeth. These consist of hollowing, increased fragility, often overgrowth in length, and a change from the usual pearly semi-translucency to a snowy white opacity. These defects do not appear when the thyroid is removed together with the parathyroids. The facts are quite striking, but the explanation is not very obvious, although the author attempts to give one. It is of interest to note that the submaxillary enlarges after parathyroidectomy alone, but that this enlargement does not occur when the thyroid is also removed.

Hammett, F. S. STUDIES OF THYROID APPARATUS IX. [Am. J. of Phys., LXV, No. 2.]

A further study by this author on the growth in body length, body weight and tail length of male and female albino rats deprived of the thyroid and parathyroid, or of the parathyroid glands alone at 100 days of age and then allowed to grow until 150 days of age. The response was a retardation in growth of the parts measured. From the quantitative standpoint the growth of the females was retarded or obstructed to a greater degree by the experimental procedure than was that of the males. It would appear from this that the female rat is more dependent on the stabilizing influence of the thyroid and parathyroid glands in growth than are the males.

Sainton, P., and Schulmann, E. RESPIRATION IN EXOPHTHALMIC GOITER. [Annales de Médecine, XII, No. 3.]

Spirometer, radiology and valve-controlled respiration findings in fifteen patients with exophthalmic goiter are here recorded. The oculo-

cardiac reflex, the chest expansion, and ability to hold the breath were also tested. All point to a permanent acceleration of the respiration. Eighteen seconds was the average length of time of breath holding ability; this is one of the signs of the special need for oxygen.

Curschmann, H. HYPOTHYROIDISM AND CONSTITUTION. [D. Zschr. f. Nervhik., LXVIII, LXIX, 40.]

The author discusses the relation of myxedema to the famine conditions following the war. There is no doubt of an influence of depleted nutrition upon myxedema yet since myxedema has appeared in only a small portion of those suffering from lack of nutrition one must suppose a constitutional readiness in these cases for the development of this disease. Curschmann does not accept this constitutional basis necessarily in so outspoken a form as has been designated in the terms of some authors, "hypothyroid constitution," "hypothyrotic temperament," "thyroid instability." More often cases come under observation without previously evident hypothyroidism or other dysghormonic stigmata. He cites an example of hypothyroid constitution with eunuchoid background (absence of important secondary sexual characteristics, smallness of stature, caries, constipation, sensitiveness to cold). Here the imperfect nutrition precipitated a typical myxedema. He reports also a patient of sixty years, heredity bad, *dégénéré supérieur* with cardiovasomotor, secretory and psychoneurotic symptoms persisting for decades. This could be considered a case of thyroid instability, a case of typical Quinke edema with an outbreak of typical edema under the bad nutritive conditions. Only rarely is this myxedema familial, a fact which points to its constitutional basis. An instance is cited of myxedema in mother and daughter, appearing in the latter after electrical trauma. Hereditary syphilis was the precipitating cause in two members of a family. It was probably not the only cause if one considers the infrequency of myxedema in hereditary syphilis. The author reports also a case of syringomyelia in combination with myxedema. There had been endocrinous disturbance of a less marked type for years which is interpreted as a result of congenital inferiority of several organ systems, endocrinous glands, spinal cord. Mention is also made of a case of progressive muscular dystrophy with marked signs of a congenital thyrohypoplasia combined here as is seen with a typically heredodegenerative disease. [J.]

Goetsch, E., and Browder, E. J. STUDIES ON THYROID DISORDERS No. IV. [N. Y. St. Journ. of Med., Oct., XXII, No. 10. J. A. M. A.]

Goetsch and Browder emphasize the following points: There is an increase in the blood sugar during operation and this is true whether a general or local anesthetic is used. In the control subject, with apparently normal metabolism, there is a progressive increase in the blood sugar over a period of from sixty to eighty minutes and may reach as high as 200 mg. of sugar per hundred cubic centimeters of blood. Follow-

ing this there is a gradual fall over the subsequent two, four or five days before the normal preoperative sugar level is again reached. In the common surgical cases acetone does not appear in the urine before operation but often the first postoperative specimen and sometimes those voided during the following twenty-four hours will contain a trace of or a one plus acetone. There are usually very few, if any, signs of acidosis, and the occurrence of this amount of acetone is ordinarily negligible. In cases of hyperthyroidism, however, there is a very different behavior of the blood sugar and acetone in that the blood sugar increase is less and continues only over twenty minutes when it reaches its height, following which there is usually a rapid fall to the preoperative level or even below within an hour. The higher the degree of hyperthyroidism, the less is this development of hyperglycemia. On the other hand, there is an early and progressive development of acetone, beginning immediately after operation and extending sometimes over the following two or three days and then only gradually disappearing at the end of from five to ten days when the urine becomes acetone free. Along with this acetonuria there are rather disturbing symptoms, such as headache, dry tongue, acetone odor to the breath, distressing nausea and vomiting, restlessness and often diarrhea. Feeling that the occurrence of hyperglycemia is a protective measure against the development of acidosis by sparing possibly the combustion of proteins and fats with their resulting liberation of the toxic acid bodies, Goetsch and Browder have used glucose intravenously, in 5 per cent solutions, giving amounts varying from 300 to 750 c.c. on the first development of acidosis. They now give it prophylactically in all cases of acute hyperthyroidism immediately after operation, and it has been very gratifying to be able to greatly diminish or prevent the development of acidosis.

Breitner, B. THYROID PROBLEMS. [Wien klin. Woch., XXXV, No. 56.]

This author would erect four types of thyroid disorder as follows: hypotrophic-hyporrhoeic, in which type the production and discharge of secretion are both diminished; eutrophic-hyporrhoeic, with normal production and insufficient elimination; eutrophic-hyperrhoeic with average secretion and increased discharge, and hypertrophic-hyperrhoeic, where both are increased.

Mayo, Chas. H., and Boothby, Walter M. THE DEATH RATE OF OPERATIONS ON THE THYROID GLAND. [J. A. M. A., Vol. LXXXIII, March 31.]

At the Mayo Clinic, during the year 1922, there were nineteen deaths following 1,983 operations on 1,355 patients for diseases of the thyroid gland, giving an operative mortality rate of 0.96 per cent. Charles H. Mayo and Walter M. Boothby state that such percentages, which are the common method of presenting statistics on goiter, not only fail to reveal the real truth, but conceal facts which, when brought out by a more detailed study, prove to be of great value. Statistics on surgery for

goiter should be carefully and accurately analyzed, and the results presented for each disease on the basis of the number of cases. An accurate basal metabolic rate is an index of the intensity of the disease in both exophthalmic goiter and adenomatous goiter with hyperthyroidism, and therefore, in conjunction with other factors, is of help in selecting the best time and type of surgical procedure. The basal metabolism is of even more importance as an aid in the establishment of a correct differential diagnosis of the various thyroid diseases, and as a result of its use many unnecessary and sometimes harmful operations are avoided. In this report all patients who died while under immediate observation in Rochester after surgical intervention on the thyroid gland during their present visit are classified as having died from surgical procedures, regardless of the cause of death. The surgical mortality by case, according to Plummer's classification of thyroid diseases, is: Adenomatous goiter without hyperthyroidism, 0.15 per cent; adenomatous goiter with hyperthyroidism, 3.48 per cent; and exophthalmic goiter, 1.99 per cent. The mortality rate for thyroidectomy in exophthalmic goiter is 0.96 per cent. The surgical mortality represents the combined work of eight surgeons.

Means, J. H., and Holmes, G. W. THE X-RAY TREATMENT OF TOXIC GOITER. [Arch. Int. Med., Vol. XXXI, March.]

The results of a research on 58 cases, in order to determine if the X-ray treatment of toxic goiter (exophthalmic goiter and toxic adenoma) did any good or harm, are here given. The authors conclude that the X-rays probably have a beneficial effect in toxic goiters. About two-thirds of the patients with exophthalmic goiter so treated show either recovery or improvement coincident with the treatment. The remaining third neither improve nor grow worse. If good results are not obtained in exophthalmic goiter by X-ray treatment in a few months surgical treatment should be employed. Prolonged X-ray treatment in patients showing no response is undesirable. In toxic adenoma (adenoma with hyperthyroidism) there seems to be a similar improvement under X-ray treatment, but this treatment was used only for patients who refused operation. In toxic adenoma surgical treatment removes one of the actual causes of the disease, the adenoma. The indication for surgical treatment would therefore seem more definite in adenomatous rather than in exophthalmic goiter.

Kerr, W. J., and Hensel, G. C. CARDIOVASCULAR SYSTEM IN THYROID DISEASE. [Arch. of Int. Med., Vol. XXXI, March. J. A. M. A.]

Kerr and Hensel report the cardiovascular condition of 181 patients with thyroid disease, 123 being classified as cases of adenoma and fifty-eight as cases of hyperplasia. It was evident that the cardiac signs and symptoms in toxic adenoma and hyperplasia differ only by the degree of toxicity. The vascular changes are more marked in the cases of hyper-

plastic goiter. Cardiac irregularities are more common than is generally recognized. Auricular fibrillation or auricular flutter, usually paroxysmal in type, occurred in about one-third of all toxic cases. The authors believe that such paroxysmal attacks explain the periods of palpitation which are described by a large percentage of patients. The prognosis depends in large measure on the condition of the circulation. If surgical treatment is to be carried out, the "time and extent of the operation should be governed by the circulatory condition." Treatment of the thyroid heart depends on the stage of the disease. In all cases every measure should be employed to relieve the myocardium. Rest is essential. Sedative drugs are of some value. Elimination should be kept up. Digitalis is of great value in controlling auricular fibrillation and may be of value in preventing paroxysmal attacks. The amount required in controlling auricular fibrillation is usually less than in ordinary cardiac cases. It should be continued over long periods. Decompensation should be treated as in other myocardial cases. The electrocardiogram is of value in recognizing myocardial changes, in differentiating the types of irregularities and in prognosis.

II. SENSORI-MOTOR NEUROLOGY.

1. PERIPHERAL NERVES.

Leriche and Wertheimer. ASCENDING NEURALGIA AFTER TRAUMA. [Rev. Chir., 1924.]

As previous observers have recorded Leriche finds that the trauma is often insignificant. No influence need be expected from periarterial sympathectomy as this acts only on the vessel. The pains may be severe, tenacious and progressive, with paroxysmal exacerbations. Vasomotor and trophic symptoms appear with the progress of the infection. Treatment, he thinks, should be resection of the nerve root.

Tucker, Beverley R. VON RECKLINGHAUSEN'S DISEASE WITH SPECIAL CONSIDERATION OF THE ENDOCRINE CONNECTION. [Am. Archives of Neurology and Psychiatry, Vol. II, March.]

Tucker reviews articles already in literature connecting Von Recklinghausen's disease with endocrine disturbances. He then reports nine cases with photographs of patients and tissues. In six of the nine cases there was evidence of pituitary disturbance. The suprarenals were involved more or less in several cases, being shown by excessive pigmentation, low blood pressure and absent or scant body hair. Several of the cases had central nervous system lesions due to neurofibromata. He thinks that nerve tissue can be demonstrated in all Von Recklinghausen tumors after careful search. He could not find that the sex glands had any relation to the condition. [Author's abstract.]

Jaquierod. INSTANTANEOUS CURE OF SCIATICA. [Rev. Méd. Suisse Rom., April, 1924. J. A. M. A.]

A personal record in which he reports a very simple procedure has cured his own sciatica and likewise sciatica in others. While riding on horseback he was seized with severe sciatica, and instinctively he stiffened his leg, the toes in the stirrup, the heel pushed down as far as possible, while twisting the leg in supination, twisting it from heel to hip, keeping the whole as stiff as possible, the heel down. At the same time the upper part of the body was straightened up, twisting the torso inversely to the movement of the leg, looking back over the shoulder of the side affected, while keeping the leg stiff. He studied this set of movements, theorizing to explain the mechanism of the immediate arrest of the sciatica pain. It can be done reclining on a hard surface, bracing the heel against the foot of the bed. The entire limb is extended to the utmost and twisted from hip to heel in one direction while the trunk is extended and twisted in the opposite direction. The relief is sometimes as sudden as with reduction of a dislocated shoulder. Of course, he adds, there are different kinds of sciatica, but this simple maneuver is worth a trial in any kind.

Wilson, George, and Winkleman, N. W. MULTIPLE NEURITIS FOLLOWING CARBON MONOXIDE POISONING. [Journal A. M. A., Vol. LXXXIV, May 3.]

These authors report three cases, two with necropsy, of patients who had evidences of polyneuritis occurring as a sequel to gas poisoning. These patients had clinical evidence of multiple neuritis, although the picture was unusual in that the deep reflexes were increased, due in all probability to the involvement of the globus pallidus or of the cortex or of both. In one of the cases in which no necropsy was obtained, a paradoxical condition was found in that there was spasticity and increase of the deep reflexes at the knees, while at the ankles flaccidity and lost reflexes were found. The authors believe that multiple neuritis occurring as a sequel to carbon monoxid poison is probably much more frequent than is commonly believed, yet direct pathologic evidence of such an involvement is practically unknown in the literature. The peripheral nerves are not often removed at necropsy, and this is probably why changes in these parts are not more frequently discussed.

Jáuregui, P. TREATMENT OF ULNAR PARALYSIS. [Sem. Méd., April 10, 1924.]

An illustrated description of shifting the ulnar nerve to a bed in the aponeurosis for ulnar palsy after fracture or ankylosis.

Bing, R. NEURALGIA, MYALGIA, PSYCHALGIA. [Schweiz. med. Woch. LIV, 13. Int. Dig.]

The term "neuralgia" is frequently erroneously employed. Diagnostic criteria of this condition are pains of paroxysmal onset in the region supplied by a peripheral nerve, or radiating into areas innervated by

sensory spinal roots, as, for instance, the penetrating pain of tabes. However, these root neuralgias are rare. The neuralgic attacks are sometimes preceded by prodromal sensations of burning, tension, crawling or traction in the affected area; in most cases, however, the onset is sudden, with violent pain. As a rule, no precipitating factor can be demonstrated, although temperature changes, certain movements or emotional reactions may be followed by attacks. The duration of the attack varies from a few seconds to several hours. The pain is definitely localized. Pain on pressure upon the Valleix pain points is a diagnostic sign; this symptom is not always present. Hyperesthesia of the cutaneous area involved may be noted. Localized muscle spasms may or may not be present. Vasomotor manifestations may be noted in the form of reddening and edema of the affected cutaneous area. Trigeminal neuralgia may be accompanied by increased salivation and nasal secretion and loss of hair.

Neuralgia may be due to mechanic injury, scar involvement, wounds (in which case a predisposition usually exists) toxic and infective noxae (grip, malaria, syphilis, arthritis, diabetes, nephritis, chronic constipation, alcoholism) local exposure to cold, or reflex irritation due to involvement of other areas (dental caries, ocular disturbances, foot deformities). No organic, structural changes in the affected nerve have been demonstrated.

Unlike muscular rheumatism, myalgia presents a sharply localized pain. The most typical forms are lumbago and torticollis. Constant symptoms are the marked sensitivity of the affected muscle to pressure and extension, and the functional disturbances, which may simulate paralysis. Attacks may follow local exposure to cold, prolonged compression by clothing, knap-sacks, traumatic injuries (blows, crushing injuries), violent extension, toxemias, such as syphilis, gonorrhea, grip, tuberculosis, typhoid fever, chronic nephritis, arthritis, or alcoholism; a predisposition is almost always present.

The spontaneous pain usually appears during rest and muscular relaxation; it is not as intense as that in neuralgia, and does not radiate to adjacent areas. Tenderness on pressure may be sharply localized or diffuse. Palpation of the affected muscle reveals a hardness and tension or hypertonia which may lead to contractures or to protective pseudo-paralysis. No pathologic-anatomic changes are found in the muscles.

Treatment consists of local applications of heat, massage, oral or precutaneous administration of salicylates, and, to some extent, the anti-neuralgic drugs, such as pyrazolon, phenetidin, quinin, aconite andgelsemium, which are not as effective as in cases of neuralgia. Muscular pseudosciatica or gluteal myalgia may be confused with genuine sciatica.

Geiger, et al. FURTHER RESEARCH ON HERPES ZOSTER.¹ [Edit. J. A. M. A., 1924.]

When the dorsal root ganglions become inflamed, as was found by

¹Geiger, J. C., Possible Danger of Absorption of Toxin of B. Botulinus Through Fresh Wounds and from Mucous Surfaces, *Am. J. Pub. Health*, 14:309 (April), 1924.

Head and Campbell in 1900, an eruption of herpes follows; the pathology of herpes zoster is therefore fairly well understood. However, there are different views as to the cause of such inflammation. As was pointed out in *The Journal*² recently, Teague and Goodpasture³ have been able to develop a virus from simple herpes and to produce herpetic lesions in the skin of experimental animals with this virus, the skin of the animals being rendered more sensitive by a previous application of coal tar. The most recent contribution to the subject is that of the French workers Netter and Urbain.⁴ The French investigators believe in the identity of herpes zoster with varicella. They report the securing of an antigen from the serum and the crusts of cases of herpes zoster, which was specific for antibodies in cases of herpes zoster. Furthermore, they seem to have demonstrated that this antigen has the same action on the blood serum from patients with chickenpox, and that the antigen obtained from chickenpox crusts is also specific for that in herpes zoster. Their views are supported further by clinical evidence, in that chickenpox appeared in the daughter in one family thirteen days after the appearance of herpes zoster in the mother; it appeared in a student sixteen days after he had visited a friend with herpes zoster, and it appeared in a man fourteen days after the appearance of herpes zoster in his wife. As has been pointed out by Kraus, the sequence herpes zoster after chickenpox is much less common than the reverse. It must be understood that not all observers are willing to grant the identity of the causative agent in chickenpox and in herpes zoster; and, if we are to arrive at any definite opinion in the matter, much more evidence will have to be accumulated than is now available. It has been suggested that herpes zoster be made a reportable disease, and that some attempt be made by health authorities to record instances in which it appears in relation to cases of chickenpox. The evidence seems to be clear that herpes is the result of some infectious agency. With the knowledge already accumulated, it is important that these points be cleared up, so that progress may not be delayed by intensive experimental investigations along wrong lines.

Cookson, H. A. FOUR CASES OF HERPES ZOSTER. [*Lancet*, May 3, 1924.]

This paper would argue that this syndrome is due to an infectious poliomyelitis posterior acuta. In this small epidemic it appears that they infected each other. There was chickenpox in the district, the outbreak of chickenpox being at its height when these herpes cases occurred. These four patients had had chickenpox. A fifth case occurred in a medical man who, fourteen days after seeing a patient with herpes zoster,

² The Experimental Production of Herpetic Lesions, editorial, *J. A. M. A.*, 82:1049 (March 29), 1924.

³ Teague, Oscar, and Goodpasture, E. W., *Experimental Herpes Zoster*, *J. M. Res.*, 44:185 (Dec.), 1923.

⁴ Netter, Arnold, and Urbain, Achille, Further Investigations of the Deviation of Complement in Herpes Zoster, *Compt. rend. Soc. de biol.*, 90:461, 1924.

manifested an eruption in the supra-orbital region. Twenty years previously he had had an attack of herpes zoster.

Ardin-Delteil, Azoulay and Salles. POLYNEURITIS FROM EMETIN. [Bull. d. l. Soc. Méd. d. Hôp., Vol. XLVII, April 27.]

These authors report a case of polyneuritis following an overdose of emetin. The patient received 1.22 gm. of emetin, besides 0.9 gm. neo-arsphenamin, in less than forty days. He recovered from the dysentery but for three weeks had a severe polyneuritis.

Miller, Edwin M. LATE ULNAR NERVE PALSY. [Surgery, Gynecology and Obstetrics, Vol. XL, January. Aust. M. J.]

Miller describes the classification, causes and modes of treatment for lesions of peripheral nerves, notably the ulnar nerve, associated with fractures. The lesions are classified as primary, secondary and late according to the time the signs of nerve involvement appear. The primary lesion appears at once at the time of the injury and may vary in severity from a simple contusion to a complete anatomical division. Secondary lesions come on gradually during the weeks of bone repair and are due to stretching of the nerve over growing callus or its inclusion in callus or scar tissue. Late paralysis makes its appearance many years after the fracture and it is this type that the author deals with in his account. From an analysis of the literature and the study of clinical histories he sets down the characteristic picture as follows: The primary cause in practically all cases is a fracture at the elbow in childhood, usually between the third and fifth year. In the majority the line of fracture begins laterally just below the epicondyle and passes obliquely downward and backward into the joint, causing a complete separation of the external condyle. The capitellum is displaced laterally and forward, is not reduced, non-union occurs and, growth of the humerus on its lateral side being interfered with *cubitus valgus* develops. Deformity increasing, the olecranon process impinges against the medial condyle, the ulnar groove becomes but a shallow depression, hence the nerve itself is displaced from its bed. It is then subjected to repeated slight trauma causing in time partial or complete late ulnar palsy. In the majority of cases it is noticed between the twentieth and thirtieth year after the fracture occurs. Individual noted surgeons have been enthusiastic over each of the methods of treatment as are now detailed. Cuneiform osteotomy of the humerus to correct the deformity of the elbow, no operation on the nerve itself being necessary, is the method chosen with good results by Mouchet. Simple liberation of the nerve from its bed, often tried, is insufficient, as the etiological factor is unchanged. Deepening the ulnar groove and lining it with an aponeurotica-fascial flap, theoretically correct, and used with good results by Broca, Guillemin and Mally, may fail from reformation of bone and fresh contraction of scar tissue. Transplantation of the nerve to the flexor side of the elbow has best stood the test of time

and is most used in America. The author quotes some of his records, presents a few plates and draws the conclusion that fractures of the external condyle in children should be operated on if the loose fragment cannot be accurately manipulated into position, because the growth upset as previously mentioned may produce a late paralysis. At the earliest sign of this the surgeon should transplant the ulnar nerve to the flexor aspect of the elbow.

Stevenson, G. H. TENDON TRANSPLANTATION FOR MUSCULOSPIRAL PARALYSIS. [Glasgow Med. Jl., April, 1923. J. A. M. A.]

After discarding the metal splint which is applied immediately after operation, Stevenson applies a light papier maché splint made on a plaster cast and usually prepared before the operation. The materials for its production are ordinary brown paper and paste. It is easily made water-proof by a solution of cotton wool, the formula of which is as follows: water, $1\frac{3}{4}$ pints; liquor ammoniac (0.880 sp. gr.), 2 pints; copper carbonate, $3\frac{3}{4}$ ounces. After standing four hours or longer the copper has dissolved. One-half pint of water and the cotton wool, not wadding, $1\frac{3}{4}$ ounces, are added. The mixture is shaken frequently till the cotton wool is dissolved (about 24 hours).

Saito, Makoto. REGENERATION OF PERIPHERAL NERVES IN ADULT MAN. [Arb. a. d. Neurol. Inst. Wien, XXIV (H. 1), 85. Med. Sc.]

Investigations were carried out on human nerve-bundles showing irregular phenomena of regeneration after wounds of various kinds. According to the author, fibrillary appearances can be detected in the Schwann cells of the regenerating portions of such nerves. These fibrillary appearances are preceded by the occurrence of acidophil granules arranged in rows in the direction of the long axis of the Schwann cells, and followed by the production of a thin sheath. The author avoids expressing a definite opinion as to the precise nature of these appearances and only suggests that they may be materials secreted by the cytoplasm of the Schwann cells acting trophically on the newly-formed axis cylinders.

Dunn, Norton, and Stewart, F. W. TRANSPLANTATION OF THE TENSOR FASCIAE FEMORIS IN PARALYSIS OF THE QUADRICEPS MUSCLE. [The British Journal of Surgery, Vol. II, January.]

These observers apply a safe clinical test in the selection of tendons for successful transplantation in the lower extremity, namely that the muscles transplanted should be those used by the patient in his effort to replace the action of the paralyzed muscle. In an appreciable number of instances of infantile paralysis the power of extending the knee joint is lost while the sartorius and the *tensor fasciae femoris* may be healthy. The authors contend that if such a patient is asked to extend the knee-joint, one or both of these muscles will contract. By altering their

insertion to the patella their contraction becomes effective in extending the knee joint. An operation is described for transplanting the *tensor fasciæ femoris* and has been carried out in two instances. The skin incision is made from the anterior superior spine to a point below the knee joint on the lateral side where it curves across the tibia. Flaps are raised on either side, the anterior one sufficiently to expose the patella. The anterior and posterior borders of the *tensor fasciæ femoris* throughout its length are exposed. From the two borders of the muscle two incisions extend downwards to the knee joint separating a strip of fascia equal to the breadth of the muscle at its insertion. This long ribbon of fascia and muscle is freed and transplanted to the quadriceps tendon and to patella. No strain should be put on the new insertion for six weeks and reëducation is necessary. In both the instances reported the transplanted muscle hypertrophied and active extension of the knee became possible.

Stookey, B. ARTIFICIAL NERVE BRANCHES FOR INNERVATION OF PARALYZED MUSCLES. [Arch. of Surg., Vol. IX, May. J. A. M. A.]

When muscular branches are destroyed and nerve suture is impossible, Stookey shows that paralyzed muscle may be innervated by the formation of an artificial nerve branch. When a free nerve transplant is sutured to the nerve trunk and the distal end implanted directly into the muscle, the free nerve transplant serves as a conduction path from the nerve trunk to the muscle. An artificial nerve branch may be made for a muscle from a nerve trunk which normally supplies the muscle; or, if this nerve trunk is totally destroyed, a branch may be made from an adjacent nerve. Thus a muscle may be brought under the domain of a nerve which never supplies it normally; for example, the biceps may be supplied by an artificial branch from the musculocutaneous, or, if the musculocutaneous is destroyed, it may be innervated by an artificial branch from the ulnar or median nerve. Evidence that paralyzed muscles may be neurotized by an artificial nerve branch was shown by electric stimulation of the artificial nerve branch, resulting in rapid and quick contraction of the muscle, by the normal size and color of the muscle, and by the histologic findings, which revealed normal striations in the muscle fibers. The presence of nerve branches and nerve fibers in the muscle thus innervated is conclusive evidence that neurotization has taken place.

Morpurgo, B. NERVE REGENERATION FROM ONE INTO OTHER OF TWO RATS UNITED IN SIAMESE PAIRS. [Jl. Phys., Oct., 1923.]

Experimental research on two rats who were united parabiotically. No nervous connections were formed. In order to determine whether this was due to the incapacity of the nerves of one individual to grow into the other. Artificial nervous connections were made in Siamese pairs of rats. Here nervous connections were formed. For instance, the sciatic trunk of the left hand rat sends branches both into the leg

of the right hand rat and into that of the left hand one; a nerve path in the shape of a Y, turned upside down is formed which, from the legs of both rats, reaches the spinal cord of the left hand rat. The regeneration of the nerve endings takes place in both rats. Neurotendinous organs and muscle spindles also reformed.

Wohlwill, F. PATHOLOGICAL ANATOMY OF HERPES ZOSTER. [Ztschr. f. d. ges. Neurol. u. Psychiat., LXXXIX, 171. Med. Sc.]

The author has examined the nervous system in six cases of "idiopathic" and four of "symptomatic" herpes zoster. He finds in all cases a lesion of the primary sensory neurone. The posterior root ganglion is most commonly involved, though not constantly. In one instance the cord was the seat of the lesion. In idiopathic zoster the cord is constantly involved, and he speaks of the lesion as a poliomyelitis posterior, the result of an ascending lymphogenous perineural infection, to which the posterior root ganglion is not always an effective obstacle. There is no conclusive evidence that the "virus" in question gains entrance to the peripheral nerve channels through the skin. In some cases the poliomyelitis posterior is intense, but differs in its histological picture from that of acute anterior poliomyelitis (Heine-Medin). The essential condition of the development of zoster is an affection of the primary sensory neurone, both distal and proximal to the ganglion, and the characteristic cutaneous lesion develops when an infectious irritative lesion of this neurone reflexly disturbs the vasomotor innervation of the skin area concerned. In idiopathic zoster, in all probability, a specific organism is in question, acting both upon the peripheral sensory neurone and upon the skin innervated by it. He believes that a similar double process is at work in symptomatic herpes. In one of the cases studied, an outbreak of herpes was the first sign of an ascending Landry's paralysis. [F. M. R. Walshe.]

Von Bokay, J. THE HERPES ZOSTER-VARICELLA QUESTION. [Jahrbuch f. Kinderh., Vol. CX, March 5. J. A. M. A.]

Bókay, who established thirty-five years ago the clinical entity of varicellous herpes zoster, states that now investigators in various countries are confirming his original assumption of the kinship between zoster and varicella. The practical consequence should be that herpes zoster can no longer be considered a simple nervous affection, but as a contagion conveyor.

Otto, K. GANGRENE OF FINGER FROM CERVICAL RIB. [Med. Klinik., Vol. XX, Jan. 20.]

This unique situation of a patient with extraordinary development of the seventh cervical rib who suffered from neuralgias. She died after acute thrombosis of the right brachial artery followed by gangrene of the fingers and a pneumonia.

Stevenson, G. H. PELLAGRA. [Can. Med. Assoc. J., July, 1923. J. A. M. A.]

One of Stevenson's patients had been psychotic for sixteen years. She had always been finicky about her food and at times refrained from eating for fear of being poisoned. She was ill about nine months, presenting symptoms that were thought to be due to autointoxication from being habitually constipated. Then diarrhea and weakness appeared, for which no cause was found and she was given a tonic and special diet and showed some improvement, but diarrhea continued intermittently until an acute attack set in. The patient developed a pronounced asthenia and her mental state became one of confusion, disorientation and mild delirium. The diarrhea did not respond to treatment. The patient died. A necropsy was not obtained. In the second case a psychosis developed as one of the symptoms of pellagra. There was no known dietetic insufficiency although the woman had always lived in rather meager circumstances.

Brouwer, B. POLYNEURITIS WITH BILATERAL ASTEREOGNOSIS. [Nederlandsch Tijdschr. voor Geneeskunde, LXVII, p. 1164.]

Brouwer reports a case of severe polyneuritis, of uncertain origin, in a man of forty who twenty years previously had malaria in India and had had many attacks since that time. He was of good antecedents and heredity, no syphilis. During a severe attack of fever in January, 1922—which according to blood tests was not malarial—he became very slack and tired. When he was three days free from fever he collapsed, his legs being powerless; a week later arms and legs were paralyzed; all his limbs were numb, and he had tingling in fingers and toes. No spontaneous pain, but pressure on abdomen gave violent pain. He recovered somewhat under treatment by electricity and baths. His spleen is enlarged; heart and lungs no changes. Wassermann negative in blood and spinal fluid. Tactile sensibility is slightly affected in the distal parts of the legs, and so also are pain and temperature sensibility; the muscle and joint power in the toes is minus. In the hands cotton wool sensibility is only slightly diminished, but patient is convinced that the point of a needle is less felt on the periphery of the hand than more proximally; the same is true for warmth and cold sensibility in both hands; localization is good. But the discrimination sense is much affected; the compass distance is about doubled. Deep sensibility in fingers and hands is normal. There is total astereognosis; hardly any object can be recognized when his eyes are shut, nor can their shape be indicated, and slight variations of weights are not perceived. The left hand is not quite so badly affected, yet small objects are not recognized. Astereognosis, common in affections of the central nervous system, is relatively uncommon in peripheral affections, and seems to depend usually on disturbance of deep sensibility. But this case shows that the loss of the finer cutaneous sensibility can render

impossible the recognition of objects and their shapes. Probably it is in this case the disturbance of the discrimination sense that renders stereognosis difficult. Beri-beri was thought of as a possible cause, but there was nothing definite in favor of it. [Leonard J. Kidd, London, England.]

McClellan, R. H., and Goodpasture, E. W. METHOD OF DEMONSTRATING EXPERIMENTAL GROSS LESIONS OF CENTRAL NERVOUS SYSTEM. [Jl. Med. Res., Dec., 1923.]

These authors devised a specific stain for acute herpetic lesions of the central nervous system. Intravenous injections of trypan blue were given, thus rendering the lesions visible by later treatment by the method of Spalteholz.

3. SPINAL CORD.

Jensen, W., and Schroder, G. E. TRANSMISSION OF THE VIRUS OF DISSEMINATED SCLEROSIS TO ANIMALS. [Hosp., Feb. 14, 1923.]

Seven cases of this disease have been used to attempt to transmit a disease. They used nine rabbits and twenty-five guinea pigs, the injection being intraperitoneal and intracerebral as well as into the anterior chamber of the eye. Only in one case did they succeed. The patient was a man, aged twenty, with typical disseminated sclerosis. The necropsy showed no spirochetes nor other germs in the brain, but in the cord there were found spirochetes, most of which were pointed at both ends. Cerebrospinal fluid, taken from this patient during life, was injected into three rabbits and three guinea pigs by the intracerebral route. One of the guinea pigs developed paralysis of the hind legs, and examination of its cerebrum and spinal medulla showed leptomeningitis and round cell infiltration, as well as degenerative changes which could not be traced to incidental infection. Spirochetes could not, however, be found in the central nervous system of this guinea pig.

Long, E. MULTIPLE SCLEROSIS. [Rev. Méd. d. l. Suisse Rom., January, XLIII, No. 1.]

A contribution to a collective injury in Switzerland in regard to multiple sclerosis. The meager results from treatment, even with sodium cacodylate in large doses, while arsphenamin has proved even more disappointing, are commented on.

Cadwalader, W. B., and McConnell, J. W. DIAGNOSIS OF MULTIPLE SCLEROSIS. [Am. Jl. of Med. Sc., Vol. CLXIII, March. J. A. M. A.]

Cadwalader and McConnell state that the sequence, mode of development, and the combination of signs are more important than the individual symptoms themselves. In addition, the occurrence of cerebral symptoms,

most particularly scanning speech and nystagmus, either alone or after spinal symptoms have developed, or the reverse—spinal symptoms following the cerebral manifestations—is strongly indicative of the dissemination of the pathologic process. If there is a history of earlier remissions, or of a discontinuance of the process in the early stages, followed by a progressive course, the nature of the disease can be determined with considerable accuracy. With the exception of syphilis, no subacute or chronic disease other than multiple sclerosis presents this remittent picture so constantly.

Neubürger, K. ON THE HISTOPATHOLOGY OF DISSEMINATED SCLEROSIS IN CHILDREN. [*Ztschr. f. d. ges. Neurol. u. Psychiat.*, LXXVI, 384. *Med. Sc.*]

True disseminated sclerosis is very rare in children, and this lends a particular interest to the case carefully investigated by the author. The patient, a well developed girl, four and one-half years old, showed at first only a progressive weakness of the legs, a diminution of visual acuity, and frequent crying. In course of time all the principal symptoms of disseminated sclerosis developed, and the child died one and one-half years after the beginning of the disease. At the post mortem examination tuberculosis of the superior lobe of the left lung and a congestion of the abdominal organs were found. In the white substance of the brain and spinal cord many typical plaques were observed. On histological examination it was found that in the obviously oldest plaques not only the medullary sheaths but also the axis cylinders were degenerated. In some plaques the myelin sheaths were incompletely affected or small groups of medullated nerve fibers had survived in an almost healthy condition, thus giving rise to peculiar pictures termed, after Schlesinger, foci of medullary shadows ("Markschattenherden"). The degeneration of the medullary sheaths was associated with an accumulation of lipoid and fatty materials at the edges of the foci or within the most recent of them. Part of the degeneration products lay free in the nerve substance or in the adventitial spaces; part had been ingested by large phagocytes ("gitter" cells) and hypertrophic neuroglia cells. These were not only larger but also very numerous in all foci. The proliferation of the neuroglia was associated, in the recent plaques, with small celled perivascular infiltrations consisting of lymphocytes and a few plasma cells. Nerve cell degeneration was limited to those groups of cells in the white substance which are known to exist in the brain of children, particularly in pathological conditions preventing its development. An interesting and rather peculiar finding was the presence of a great number of multinucleated giant cells, either adjacent to middle sized and small blood vessels or scattered round and within those foci where small celled infiltration had also been seen. On account of their

situation and structure, absence of neuroglia fibers, and transition forms between them and hypertrophic neuroglia cells, the author felt inclined to consider them as due to a process of fusion of proliferated adventitial cells. Attempts at finding an agent, the possible cause of these various lesions, were attended by negative results. [C. da Fano.]

Pick, L. PRODUCTION OF BONE IN THE EPINEURIUM OF THE SCIATIC NERVE IN A CHRONIC AFFECTION OF THE SPINAL CORD. [Beitr. z. path. Anat. u. z. allg. Path., LXIX, 496. Med. Sc.]

An extensive production of bone was observed in the epineurium of the left sciatic nerve in a case of funicular myelitis complicated by foci of softening in the cervical and dorsal regions. The bone production was associated with a reduction in size of the nerve bundles and an increase of the peri- and endo-neurium, and of the interfascicular adipose tissue. The phenomenon does not essentially differ from the ossification observed in the muscles and fasciae of paralytic limbs and should be considered as a form of metaplasia, and not as the result of a supposed inflammatory process. [C. da Fano.]

Schröder, P. FUNICULAR SCLEROSIS. [D. med. Wschr., Vol. XLIX, No. 5.]

Schröder makes a detailed study from nineteen cases of the disease form which Spielmeyer has called "funicular spinal disease" and which has been described by Nonne and Henneberg. He notes how frequently it is associated with severe anemia. In perhaps half of the cases showing a special form of the disease pernicious anemia was far more in evidence than the neurological symptoms, in the other cases the reverse was true. All the cases belong in a special way to myelitis.

Loudon, Julian. DISSEMINATED SCLEROSIS. [Annals of Clinical Medicine, Vol. I, February.]

This article is the report of an address given before the Ontario Neuro-Psychiatric Association in August, 1922. The frequency of occurrence of disseminated or multiple sclerosis amongst the diseases of the cerebrospinal axis was sufficient reason for the selection of the subject. The object of the address was the correlation of the clinical symptoms and signs with the recent advancement in knowledge along bacteriological, serological and experimental lines. In discussing the etiological factors the infectious origin of certain cases of the syndrome is taken as proved, and the existence of a specific spirochete as the causative agent is held to be most likely. The study of the pathology exhibits many complexities and anomalies. The myelin sheath degenerates out of proportion to the axis cylinders. This degeneration occurs in scattered patches throughout the whole of the central nervous system and is probably primary to the neuroglial overgrowth which appears to accompany it. Clinically the most important symptoms and signs for

early diagnosis are bladder and pyramidal tract disturbance in patients between the ages of fifteen and forty-five, providing there is no syphilitic history and a negative Wassermann reaction in the blood and cerebrospinal fluid. Other early manifestations may be undue pallor of the outer side of the optic disc, central scotomata, and absence of the abdominal reflexes. Discussing Charcot's triad (intention tremor, nystagmus and scanning speech), Loudon says: "We now know that, although one or two of these signs may appear fairly early in the course of the disease, the group as a whole is usually late in making its appearance and a refusal to make a diagnosis in its absence will cause mistakes in the recognition of many cases." The cerebrospinal fluid may show a normal appearance with a normal pressure. The paretic colloidal gold curve may be present and the Wassermann reaction negative. Slight increase in the number of lymphocytes and arachnoid mononuclears is present according to some authors. The total protein is normal or slightly increased with absence or a slight trace of globulin. The more progressive the disease the more likely is the cerebrospinal fluid to show the above noted changes. The differential diagnosis is discussed and cases are cited to illustrate how confusion may arise. The only known treatment is symptomatic and palliative, but early diagnosis is essential if any arrest of the disease is to be expected. [Author's abstract.]

Schob, F. MULTIPLE SCLEROSIS IN BROTHERS AND SISTERS. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXX, Nos. 1-4.]

Schob found histological proof of multiple sclerosis in two members of a family. Both cases showed marked infiltrative processes. He considers the findings to point to an exogenous cause for the disease.

Krabbe, Knud H. THE CLASSIC AND THE COMMON FORMS OF DISSEMINATED SCLEROSIS. [Ugeskrift for Laeger (Copenhagen), Vol. LXXXIV.]

In many textbooks of neurology one finds the description of the typical signs of disseminated sclerosis corresponding to the Charcot's triad: nystagmus, syllabic speech and intention tremor. In other books it is considered that this classic form of the disease is rather rare compared with the cases representing other types. Author concludes that these last authors are right. He describes briefly from his own praxis in the last year twelve cases of disseminated sclerosis. More of them show the well known fact that there has been a marked retrobulbar optic neuritis many years before the development of the other symptoms. In most cases the typical symptoms are: spastic paraplegia of the lower limbs and slight atrophy of the temporal part of the disc; to these two fundamental symptoms can be added slight and changing oculomotor disorders, sphincter disturbances and slight sensibility troubles. But nystagmus, intention tremor and syllabic speech are really relatively

rare. The author has treated some of the cases with silver salvarsan. But it is still impossible to say anything on the results of the treatment in a disease with a so remittent a character. [Author's abstract.]

Stefanopoulo. INFECTIOUS ORIGIN OF MULTIPLE SCLEROSIS. [Bulletin Médical, Vol. XXXVI, No. 30, p. 594. J. A. M. A.]

Stefanopoulo gives photomicrograms of the spirochetes found in the cerebrospinal fluid of monkeys, rabbits or guinea pigs inoculated with cerebrospinal fluid from patients with multiple sclerosis. He calls it the "S microörganism," and states that the experiments succeeded only in eleven of the sixteen clinical cases, but the microörganism was found in the spinal fluid in two of the latter.

Gans, A. DIFFUSE SCLEROSIS. [Nederlandsch Tijdschr. voor Geneeskunde, LXVII, March 10, p. 1043.]

Gans reports a case of diffuse sclerosis in a woman of thirty. About ten years ago she had motor symptoms. From her early youth she had ethical defects and was nymphomaniac. She spent the last five years of her life in an asylum on account of her moral defects. She had symptoms suggestive of disseminated sclerosis: nystagmus, scanning speech, intention tremor, increased reflexes and Babinski's sign. Her intelligence was normal. Death by influenzal pneumonia. The brain showed nothing noteworthy macroscopically; but frontal sections revealed around the ventricles a more or less symmetrical focus in the hemispheres of enormous extent (from the frontal to the occipital lobes): the tissue was grayish, jelly-like but yet rather hard to the cut. The large focus consists almost entirely of glia fibers with very few nuclei; the axis cylinders are to a large extent destroyed; round the vessels there are small infiltrations, and there are large ones, consisting wholly of plasma cells, round the vessels of the pia. In addition to the large focus there are numerous foci of sclerosis and plaques in the brain and spinal cord. At the point of transition between a large focus and a focus of sclerosis and a plaque there are recent products of disintegration. ([Leonard J. Kidd, London, England.]

Böhmig, W. EARLY SYMPTOMS IN DISSEMINATED SCLEROSIS. [Deutsche Ztschr. f. Nervenhe., LXXV, 24. Med. Sc.]

The author has analyzed the clinical records of 155 cases of disseminated sclerosis observed in the Eppendorfer Krankenhaus at Hamburg (Professor Nonne) during the decade 1910-1920. Taking the symptoms singly he finds that loss of the abdominal reflexes was noted in 65 per cent of the series, spastic weakness of the legs in 60 per cent, nystagmus in 47 per cent, pallor of the temporal halves of the optic disks in 30 per cent, intention tremor in 30 per cent, scanning speech in 9 per cent, and psychical changes in 2 per cent. Taking the symptom

complex as a whole, the so-called "classical clinical picture" of the disease was present in 9 per cent only, loss of abdominal reflexes and spastic weakness of the legs in 42 per cent, nystagmus and loss of abdominal reflexes in 32 per cent, nystagmus and pallor of the disks in 17 per cent, and loss of abdominal reflexes and intention tremor of the upper limbs in 27 per cent. Böhmig states as a working rule that, syphilis being excluded, the addition of any single nervous physical sign to the combination of spastic phenomena in the lower limbs and loss of abdominal reflexes justifies a diagnosis of disseminated sclerosis, and that this diagnosis is probably correct in the presence of any three of the symptoms mentioned in the list given above. He regards an unduly ready fatigue of the lower limbs as the most constant initial subjective symptom of the disease, and many antedate further symptoms for a period ranging from six months to several years. Examination of a separate series of thirteen cases during this stage reveals spastic phenomena as the most constant finding (61 per cent), though loss of the abdominal reflexes was also present in 38 per cent, nystagmus and intention tremor in 23 per cent, and nystagmus in 23 per cent. At a later stage when diagnosis became certain (in the smaller series) pallor of the disks was present in 76 per cent and loss of the abdominal reflexes in 84 per cent. Disturbance of articulation was the rarest of the initial symptoms. [F. M. R. Walshe.]

III. SYMBOLIC NEUROLOGY.

2. EPILEPSIES.

Thompson, E. J. F. SOME OBSERVATIONS ON THE PARATHYROID AND ITS USE IN MENTAL CONDITIONS. [Australian Med. Jl., 1924.]

The paper has been divided into two parts: (1) Embryological, (2) Clinical. Apart from the general interest of development, the embryological study of those endocrine glands which originate in connection with the bronchial pouches seems to afford a rational explanation of two points which have given rise to much discussion. In the experimental sphere the variations of the results of parathyroidectomy have led to some scepticism in regard to their function. These variations (the writer believes) have a rational explanation in the presence of accessory parathyroid tissue and is difficult of recognition except under the microscope. "In view of the comparative embryology of the (parathyroid) glands and remembering that thymus tissue has been described both in lower vertebrates and in birds and mammals as developing from a series of (bronchial) clefts, it is not surprising to find in human beings a number of accessory parathyroids, especially in relation to the thymus gland." Secondly, embryology seems to afford an explanation of why some endocrine glands are efficacious in oral administration while others have

little or no effect. The thyroid, parathyroids, thymus and possibly part of the pituitary glands being developed in connection with the anterior end of the alimentary tract, it seems reasonable that their secretions will not be destroyed by passage through the stomach, while the other endocrine extracts will be adversely affected by the action of the gastric juice.

Before taking the purely clinical aspect, the second part deals with the brain on which the treatment is founded. The parathyroids are associated with the parasympathetic portion of the autonomic nervous system which is anabolic in function "directing energy inwards where it is stored up" (Langdon Brown).

Four points seem to be fairly well established: (1) that absence or deficiency of parathyroid result in the syndrome characterized by tetany or tetanoid, (2) that parathyroid activity is intimately connected with calcium metabolism, (3) that it is an important factor in neutralizing toxic conditions, (4) that in leucopenic states parathyroid extract increases the leucocyte blood count.

Groves and Vines have demonstrated the increase of the ionic calcium in the blood in the treatment by parathyroid of the chronic toxic states. Calcium has been shown experimentally to be a depressant to the excitability of nerve. The manifestation of hyperexcitability in a large percentage of women during menstruation, when as Blair Bell has shown, there is an increased elimination of calcium, and the frequency of mental "breakdowns" at puberty and the menopause are at least suggestive of some disturbance of calcium metabolism. In many acute toxic states hyperexcitability can be translated in terms of a sympathetic stimulation leading to katabolism of tissue, an increase of toxic products and a decrease of ionic calcium. Chronic toxic states Vines considers to be of a similar nature in which there is "a low grade sympathetic stimulation" with a corresponding depression of the parasympathetic accompanied by a decrease of ionic calcium in the blood. In the treatment of some chronic toxic states by parathyroid, Grove and Vines demonstrate a marked increase in ionic calcium and a restoration of the sympathetic-parasympathetic balance leading to the anabolic process of healing. That parathyroid is nonspecific in its action is manifest from the variety of diseases which they treat; so varied indeed that it might seem as though parathyroid were a panacea for all ills. But in all, the underlying feature is that they are chronic toxic states.

The chronic nature of many mental states often accompanied by chronic physical disease is very marked in a great number of mental cases. Those which have been chosen for parathyroid treatment have mostly been of a chronic nature, not of any one type, but characterized by one common feature, viz., *hyperexcitability*, whether in manic or melancholic form. The treatment is based on (1) the increase by parathyroid of the ionic calcium in the blood and its depressant effect, (2) the nonspecific detoxicant effect of parathyroid, (3) the reestablishment of

the sympathetic-parasympathetic balance, disturbance of which is manifest by the hyperexcitability and other general symptoms.

Among the cases treated are acute and recurrent manias, agitated melancholias and hysterical patients. The cases are too few to draw any definite conclusions as yet, but the improvement in many cases and the recovery of others who were considered "chronics" hold out encouragement along this line of treatment. [Author's abstract.]

Suttel and Arsac. RESEARCH ON THE SERUM OF EPILEPTICS. [Revue Neurologique. Vol. XXXI, Aug. J. A. M. A.]

Suttel and Arsac based their experiments on the tradition that wounds, even fractures, heal in epileptics more rapidly than in the healthy. Their research suggests that the serum contains a substance which produces the seizures, and also promotes cicatrization. They were unable to determine whether the substance is more active before or after the seizure, or if it depends on the frequency of the seizures. It may yet prove possible to isolate the causal substance from the serum, and determine its origin.

Sawyer, G. M. LUMINAL IN TREATMENT OF EPILEPSY. [Iowa State Med. Soc. Jl., Nov. 10, 1924. J. A. M. A.]

Sawyer claims good results from the use of luminal to control convulsions in epilepsy. She has used the drug in hundreds of cases and has not found any contraindications to its use nor has she seen any harmful effects from its administration. It is not habit-forming.

Karger, P. CAFFEINE IN EPILEPSY. [Deut. med. Woch., Vol. 50, Nov. 7.]

This writer has begun to substitute stimulants for sedatives in the treatment of epilepsy with some scepticism, although the recent work of Stargardt had made out a plausible case for this change. But the author's experience during the past three years with more than 60 cases has convinced him that caffeine may be remarkably effective in a considerable proportion of cases. With the exception of ten patients, in whom the attacks were comparatively serious, his material consisted of patients suffering from petit mal, associated in most cases with enuresis. In every case a definite connection was established between the attacks, and tiredness and sleep. At first caffeine was given only to those children in whom the attacks began on getting up or going to sleep, in the night, or towards the end of school hours. The ages of the children ranged from 3 to 13 years, and, in order to eliminate suggestion as a factor in the treatment, tinctura amara was at first given for some days: it had no effect. Caffeine was then prescribed. When the attacks used to occur in the morning only the caffeine was given before rising. The dosage and the spacing of the doses were modified according to the requirements of the individual; it was found advisable to continue the treatment for two or three months after the symptoms had disappeared and to discon-

tinue the treatment gradually. No harm was done, and there were only three cases in which this treatment was ineffective. In no case did the drug interfere with sleep, and in most cases the duration of the cure was considerable.

Felsen, J. LABORATORY STUDIES IN EPILEPSY. I. FRACTIONAL GASTRIC ANALYSIS. [*Arch. Int. Med.*, Vol. XXXV, Aug. J. A. M. A.]

The frequency of gastric symptoms in epilepsy occurring either as an aura or as a more or less continuous indescribable feeling of distress in the epigastric region prompted Felsen to make observations on fifty-three epileptics and thirty-seven other patients chosen at random as controls. Of the epilepsy group, eight cases (15 per cent) showed complete absence of free hydrochloric acid in the fasting stomach, and for a period of two hours following the ingestion of a water test meal. Six others (11 per cent) showed similar results, except that the absence of free hydrochloric acid fell somewhat short of the two-hour period. Sixteen (30 per cent) showed absence or only slight traces of free acid in the first two or three specimens. Of the thirty-seven so-called non-epileptic control group, seven (19 per cent) showed complete absence of free hydrochloric acid in all specimens. Five (13 per cent) showed absence of free hydrochloric acid in the first two or three specimens. The absence of free acid in one patient closely observed for more than a year, seemed to be associated with rapid deterioration. In one patient, the absence of free acid did not seem to be associated with the onset of an epileptiform attack. The total acid curve remained uniformly low in all cases of absence of free acid. The absence of free acid may not be pathognomonic of epilepsy, but in Felsen's opinion this fact seems worthy of further investigation. Periodic gastric analyses of epileptics and more careful investigation of all neuropsychiatric cases showing anacidity are suggested.

Bisgaard, A. PARATHYROID GLANDS AND EPILEPSY. [*Acta Med. Scan.*, Jan. 1, 1925, J. A. M. A.]

Bisgaard states that disturbance of the acid-alkali balance occurs with parathyroid insufficiency and is counteracted by parathyroid extract. The parathyroids apparently conform to the requirements formulated by Biedl for classification of a gland in the endocrine system. True epilepsy, postoperative tetany and "tetanoid neuroses" (with disturbed regulation of neutrality—reduced ammonia values) Bisgaard classifies with parathyroid dysfunction. In these conditions, parathyroid extract restores the ammonia values approximately to normal. He believes substitution organotherapy should be pushed more vigorously and longer. The strength of the regulatory mechanism—the parathyroid functional capacity—can be measured by the acid-loading test. The article is in English, and gives twenty-eight pages of the daily findings in six patients and a parathyroidectomized dog.

Bigwood, E. J. PHYSICO-CHEMICAL EQUILIBRIUM OF THE BLOOD IN EPILEPSY. THE CA-ION. [Journ. de Physiol. et de Path. Gen. 22, No. 1.]

(1) Comital alkalosis may be arranged among those modifications of the acid-base equilibrium due to a vitiation of the neutralizing mechanism. It is not due to a superabundance of the alkaline reactions in the body. There is no such thing as alkaline intoxication in the epileptic. The renal and respiratory factors of this mechanism cannot be incriminated in the pathogeny of the humoral disturbances. [Is this so in view of the hyperpnea experiments and setting free convulsion phenomena? J.]

(2) Alkalosis constitutes the primary cause of the phase of cellular hyperexcitability which determine the convulsive accidents of epileptic disease and of the numerous varieties of tetany. Hyperalkalinity exercises a depressive action upon the content of the blood of its calcium ions and it is by the intermediation of this action that it exposes the patient to the convulsive troubles.

(3) Alkalosis is not followed by epileptic crisis when the calcium of the calcium ion remains normal.

(4) The study of the blood content of calcium ions leads to the same dismemberment of the nosological category of epilepsy as the study of the neutralizing mechanism.

(5) The theory that associates the calcium ions to the alkalosis in the humoral syndrome responsible for epilepsy and tetany accords better with the experimental facts observed than those hypotheses based solely on alkalosis or upon calcium deficiency alone.

(6) The study of acid medication shows that this operates through two distinct mechanisms. One of these is characterized by the direct action of pH in its action on the alkali reserve, the other, on the contrary, deploys its action in the alkali reserve and modifies the pH by means of this action.

(7) The reaction and the content of Ca ions of the blood constitute the two essential factors which regulate the general cellular excitability. [R. Mourgue, Paris.]

3. PSYCHOSES.

Bevis, W. M. PSYCHOLOGICAL TRAITS AND PSYCHOSES OF THE SOUTHERN NEGRO. [Am. Jl. of Psychiat., Vol. I, No. 1.]

The writer's conclusions are that the negro has certain peculiar psychological traits which are reflected in his psychoses. Alcoholic psychoses, suicidal tendencies and neurosyphilis are relatively infrequent while dementia precox and manic depressive are relatively more frequent than in white people. There are certain peculiarities about this in that catatonic dementia precox is twice as frequent as in the white race and of the manic depressive cases the manic phase is the one nearly always seen. [Menninger.]

D'Allonnes, R. THOUGHT-THEFT OBSESSION. [Encéphale, Vol. 19, Feb.]

D'Allonnes establishes a new clinical entity with the name polyphrenia. The extremely heterogeneous elements of this condition are cemented together by the morbid cenesthetic idea inducing a person to believe that his thoughts are being sucked out of his brain or simply being stolen from him. The mechanism is so special that there is need of giving this condition particular consideration. This type of dissociation must not be treated in the routine manner of dealing with common schizophrenias.

de Saussure, R. DIFFERENTIATION OF MANIC DEPRESSIVE PSYCHOSIS. [Encéphale, Vol. 19, Feb.]

This psychiatrist of Geneva thinks that Kretschmer's types will be valuable in psychiatry in future. The correlation between his somatic types and the distribution of the two fundamental general roots of mental makeup—the cycloid and the schizoid—must be more critically registered and interpreted in the records of state hospitals. Only by this means will it be possible to differentiate and determine an approximately reliable prognosis of each disease, respectively.

Friedjung, J. K. CRIMINALITY IN CHILDREN. [Med. Klinik, Jan. 20. Vol. 120.]

The typical amnesia of adults for their own criminal tendencies in childhood as the real source of the difficulty in understanding the violent actions of children. Jealousy of the younger babies is a very frequent cause.

Masson, Clement B. THE MENTAL CONCOMITANTS OF DIABETES MELITUS. [New York Medical Journal and Medical Record, May 16, Vol. 20.]

There is no physical ailment that does not have psychic symptoms or concomitants. In diabetes as regards aberrant mental reactions, there are three groups of cases: first, those in which diabetes is only a complication or passive accompaniment of a psychosis; cases of autotoxic origin and admittedly due to diabetes, and lastly, those in which diabetes exists conditioning arteriosclerosis, and thus causes cerebral deterioration. In the literature actual diabetic psychoses are rare and take the form usually of depression with morbid ideas for the future, delusions of worthlessness, while hallucinations are not uncommon. In both of the author's cases diabetes developed during the course of the psychosis and had no direct effect, as could be observed, upon the mental status of the patients. Each of these cases, given Allen treatment, had periods of varying duration when sugar-free, and their mental status noted as compared to periods when their blood sugar was high. Charts were kept and careful notes made correlating physical and mental findings. These

cases were hospitalized in a mental hospital for years so that mild mental symptoms attributable to diabetes could have been overshadowed by their established psychotic manifestations. However, there was no aggravation nor amelioration of their mental symptoms under disturbed or normal sugar metabolism.

However physical and mental symptoms may be correlated, there are three factors which play an important rôle in the development of a psychosis or less organized psychic disturbances associated with diabetes; namely, arteriosclerosis, the involutional period and a neuropathic background. Aside from a definite psychosis in diabetes we have less organized, less malignant psychic troubles such as intellectual laziness, diminution of memory, hypochondriac preoccupations, hypo-affectivity with egocentric tendencies and diminution of moral and physical energies. These are the common findings of many observers. Therefore before definite mental symptoms can be directly attributed to that form of brain intoxication accompanying diabetes mellitus, further study of selected cases with free use of blood chemistry will be necessary. [Author's abstract.]

Laird, Donald A. MENTAL HEALTH OF THE COMMUNITY. [American Journal of Psychiatry, Vol. I, No. 1.]

The author has been interested for some time in studying the reaction of the laity to psychiatric facts and progress and in this article presents a study of a questionnaire regarding the attitude of 400 individuals (just what individuals is not stated) toward the various hospital names. These are then analyzed by a mathematical formula to determine what the writer calls a "preference coefficient." Various other ingenious schemes are suggested and implied. The upshot of the article is to show that a name such as Riverview Sanitarium is far less objectionable than Chicago Asylum, and nine or ten other possibilities are arranged in between in the order of preference. The conclusions would be valuable to anyone interested in institutional mental hygiene and the author suggests that there is much pragmatic importance in selecting the best names and terms. [Menninger.]

Stevenson, G. S. and Stultz, A. D. SELLA TURCICA IN MONGOLIAN IMBECILES. [Am. Arch. Neurol. and Psychiat, September, Vol. X, p. 299.]

Radiographic studies of the sella turcica were made in three groups of individuals. In group one, there were ten unselected mongolian imbeciles; in group two, there were five mongolians under twelve and five over twenty-seven years of age; in group three, there were five normals under twelve years and five over twenty-two years of age. The radiograms were studied for the presence of a shadow defect which had been reported as suggesting an excavation of the olivary process.

Where present, the intensity of this defect was rated. It was definitely present in fifteen of the thirty cases and of these fifteen, eleven were in the younger individuals. The defect was more prominent in the mongolian imbeciles than in the normals. The significance of this defect was studied by radiographing a dried skull. This showed that the shadow defect was the result of differences in level of the olivary process and the anterior clinoid processes and was not a bone defect, which probably means that the sella of mongolians corresponds in its development to a younger stage in normals as do other bony relations in mongolian imbeciles. [Author's abstract.]

Kelly, O. F. ACIDOPHIL DEGENERATION IN DEMENTIA PRAECOX. [Am J. Psych., Vol. 4, April.]

Acidophil degeneration, hitherto ignored, is here made the subject of special study in dementia praecox. It was found in seven of a group of ten cases clinically diagnosed dementia praecox; of the three cases in which it was not found, two were doubtful diagnoses and one was found at necropsy to be another condition. Of thirty-two cases with the diagnoses other than dementia praecox, two showed acidophil degeneration. Its distribution is considered, especially in relation to symptoms and to Kraepelin's theory of the function of the small and medium pyramidal cells.

Schilder, P. AMNESIA AFTER ATTEMPT TO HANG ONESELF. [Med. Klin., Vol. XIX, May 6.]

Study of a man who had tried to hang himself. He was resuscitated by artificial respiration but had absolute amnesia for the whole affair. This was corrected by hypnosis.

Raphael, Theophile, and Gregg, Sherman. REACTION IN DEMENTIA PRAECOX IN INTRAVENOUS ADMINISTRATION OF NON-SPECIFIC PROTEIN. [American Journal of Psychiatry, Vol I, No. 1.]

Because of the remissions noted by some in dementia praecox following acute febrile infections, the author has decided to study the result of artificially induced leucocytosis. Intensive studies were made of 7 male cases from the standpoint of temperature, blood count, blood picture, blood fragility and weight reactions. Their conclusion was that no amelioration in mental states was effected and that the general constitutional reaction was similar to that in nonpsychotic individuals with certain derogatory additions, particularly loss of weight and increased blood fragility. [Menninger.]

Potts, W. A., Pinsent, E. F. et al. MENTAL DEFICIENCY IN ITS SOCIAL ASPECT. [Br. Med. J., Aug. 11, 1923, J. A. M. A.]

The importance of the subject of mental defect, in Potts' opinion, is not fully realized. The number of mental defectives is large and the problem is intimately interwoven with most social difficulties. In the

control of venereal disease, mental defectives constitute one of the great difficulties, for they neither protect themselves against disease, nor realize the importance of treatment, especially of continuing it until the disease is cured. Chronic drunkenness, through not pathognomonic of mental defect, often claims as victims men and women whose judgment and self-control are so poorly developed as to constitute a form of feeble-mindedness. Illegitimacy also is a problem that cannot be considered regardless of mental defect. In work with criminals and delinquents punishment cannot help those who require treatment or reëducation. In dealing with the problem of the unemployed, many of whom are said to be unemployable, one of the first steps should be to sort out the mentally defective. So, too, with war pensions and "shell shock" cases. Some of these are, always have been, and always will be mentally defective. The sooner these are weeded out the better for them and for those who, both by their past record and their future possibilities, are entitled to skilled and expensive treatment. Defectives always have existed, and always will. It is not certain that there is a bigger percentage than there used to be. It may only be that the circumstances and conditions of present civilization make them more obvious. The principal cause is heredity; therefore, segregation, even if only partial, will reduce the number. But heredity, although the outstanding cause, is not the only cause. The statistics which seemed at one time to lead almost inevitably to the conclusion that heredity was the only factor that mattered have been shown to have been unduly stressed. In some cases this was due to the fact that what was likely to be inherited was not mental defect, but a psychopathic make-up; in others, notably some of the American records, the figures were based not on scientific investigation, but on hearsay evidence obtained long after the unsatisfactory ancestor was dead. Those who have the care of the mentally defective and all other social workers must join hands to combat the racial poisons, syphilis and alcohol. Other known unfavorable agencies must not be forgotten, such as infectious disease of the mother during pregnancy. Toxins and bad environment must contribute in some cases to the incidence of mental defect. Once mental defect is established little can be done to eradicate it. The great opportunity is at the antenatal clinic. Highly skilled medical practitioners are essential there; in addition, a high standard of national health, especially among married women, must be achieved. It is in the school clinic that the opportunity occurs for recognizing and scheduling the pathologic or asocial child. The more efficient the supervision, the more thorough the early investigation, the fewer persons will have to be segregated later. The public must be taught that those who are segregated are being treated and not punished, that it is the only way in which they can lead happy and useful lives. The institutional life essential for them is arranged not only for their benefit, but also in the interests of their normal brothers and sisters, who are often seriously handicapped by the presence of a defective in the home or the school.

Bonhoeffer, K. PSYCHOSES OF MALNUTRITION OF THE PELLAGRA TYPE. [D. med. Wschr., Vol. 49, No. 23.]

Bonhoeffer presents the history of 10 female patients who manifested distinct pellagroid eruptions upon the skin, also more or less high grade malnutrition and sometimes exhausting genital hemorrhage, most of them also diarrhea. There were also atypical psychic disturbances vacillating between depressive and delirant states. The greater number of cases seemed to belong to a simple pellagrous disease in which the malnutritive symptoms predominated, in the others the somatic pellagrous symptoms appeared first during treatment for psychic disorder. Maize diet apparently played no part but the scantiness and monotony of the diet was an important factor. Some results from autopsy.

East, W. Norwood. DELINQUENCY AND MENTAL DEFECT. [Br. Jl. of Med. Psychol., 1923.]

The medical witness must be acquainted with the statutory definitions of idiots, imbeciles, feeble-minded persons (morons), and moral imbeciles, as expressed in the Mental Deficiency Act of 1913, before he can satisfy a criminal court that an accused person is such as should be dealt with under this Act. Thus all the four essentials of moral imbecility as laid down by the Act: permanent mental defect, coupled with strong vicious or criminal propensities, on which punishment has had little or no deterrent effect, must be capable of demonstration, and similarly with the other definitions. In pursuance of which the number of prisoners on remand or awaiting trial, who are found to be defective within the meaning of the Act may be taken at 5%, a figure much lower than the estimate of many witnesses who gave evidence before the Royal Commission which enquired into the question, and still even lower than some figures quoted abroad. The Act has undoubtedly excluded cases which medical men would regard clinically as defectives, but whilst doing this it has ensured a very careful consideration of each case before it is dealt with as such, and has assisted in differentiating between deficiency from birth or an early age, and inefficiency from other causes.

Although a criminal court may except in capital cases (murder, etc.), deal with the accused by remitting him to a defective institution or place of safety as defined by the Act, yet amentia is not held to be a legal excuse for the commission of a criminal act unless a low grade defective is found on medical evidence to be unfit to plead. If so found a verdict is returned that the accused is insane on arraignment, and he is sentenced to be detained during His Majesty's pleasure.

As insanity within certain limits may excuse a person from responsibility for a crime, and defect, with the exception just mentioned in English law strictly applied, does not, it is necessary if possible in cases of mixed insanity and defect to distinguish between the symptoms due to insanity and those due to defect, and to determine which, if either, has affected conduct.

The differential diagnosis between some forms of early insanity and deficiency may present difficulties, and at one time I hoped to obtain assistance from the Wassermann test, but as in 128 male defectives, 9 gave positive, 17 doubtful, and 102 negative reactions, no material help was obtained.

The importance of conduct in estimating defect requires individual consideration. In court work it is generally found that the greater the intelligence defect the less conduct defect is required to satisfy the judicial authority, and conversely, the more the conduct defect the less the intelligence defect necessary.

Crimes committed by defectives vary from murder to simple acts of vagrancy, no offence is pathognomonic of defect, generally it can be said that the defective may commit any variety of crime, except, so far in my experience, that of treason. Offences of acquisition, sex, and vagrancy are the most frequent. The accused is generally below twenty years of age, after thirty few are met with, largely because the difficulty of obtaining the essential evidence of defect from birth or an early age has not been overcome, but also to some extent because the cases become segregated or supervised to a large extent before maturity. The idiot practically never comes to prison, but in 200 consecutive cases of male defectives under my observation in prison, 180 were diagnosed as feeble-minded, 15 as imbeciles, and 5 as moral imbeciles, and in most all of these institutional care was considered necessary. It is quite uncommon to find two defectives jointly committing a criminal offence, but such cases do occur from time to time, and a high grade defective may initiate a lower grade defective in criminal practices. Mental deficiency as defined in the Act is a less frequent cause of crime than insanity. It is not infrequently malingered, but the defective without insight into his condition may malingering defect, and if possessing some insight may attempt to pass himself off as normal to avoid detention in an institution.

As the defective easily forms a criminal habit, early diagnosis and treatment is fundamental, otherwise offences recur; but the medical man engaged in mental work generally has great opportunities to prevent recidivism by the early diagnosis and treatment of the psychoses, psychoneuroses, and neuroses, as well as cases of amentia. [Author's abstract.]

Weiss, Max and Izgur Leon. SYPHILIS AS A FACTOR IN THE ETIOLOGY OF MENTAL DEFICIENCY. [Journal A. M. A., Vol. LXXXIV, Jan. 5.]

An investigation was conducted to determine what percentage of admissions among children were syphilitic as judged by the Wassermann reaction and clinical examinations. One thousand, seven hundred and ninety-four serums from 1,633 patients were tested. Of these, forty-one were positive, and forty-four were doubtful. If every case presenting from one to four plus reactions on the cholesterinized antigens (so-called doubtful reactions) is considered a case of syphilis, the total incidence of syphilis based on Wassermann reactions would be 5.2 per cent. In

accordance with the Citron method of reading, the authors have considered as positive only those serums which showed fixation with alcoholic as well as with cholesterinized antigen. One hundred and twenty cases examined clinically presented at least one of the so-called stigmas. Of the 120, only thirteen presented more than one so-called stigma, and 107 only one. Of the 107 that presented only one stigma, in eighty-five it was unilateral or bilateral epitrochlear enlargement. In other words, in the 120 cases in which a suspicion as to the presence of syphilis could be raised on the basis of clinical examination, in almost 71 per cent of the cases the only finding was epitrochlear adenopathy, either unilateral or bilateral. In only one patient did the classical picture of late hereditary syphilis, hutchinsonian teeth, saddle-back nose, rhagades and evidences of past interstitial keratitis present itself. On the basis of these serologic results, less than 3 per cent of defectives were definitely syphilitic. Clinical examinations for the stigmata of syphilis revealed 15.5 per cent of patients with one or more of the so-called stigmas. It would seem not only that syphilis is uncommon in mental defectives but also that it is less common than in the general population, and is comparable in frequency only with congenital syphilis at any lying-in or child-caring institution. Furthermore, if syphilis is a cause of mental deficiency, it should occur far more frequently in mentally deficient than in mentally normal children; the evidence adduced in this study controverts such an assumption.

Cowie, D. M., Parsons, J. P. and Raphael, T. INSULIN AND MENTAL DEPRESSION. [Mich. St. Med. Soc. J., Sept. 1923.]

The authors have determined the following points: The prolonged glucose utilization curve of manic-depressive depression is easily made to conform to the normal curve by the administration of a certain amount of insulin. This amount of insulin may be a measure of the dysfunction of the pancreas or of the activity of the opposing factors.

May, J. V. IMPORTANCE OF PSYCHIATRY IN PRACTICE OF MEDICINE. [Boston Med. & Surg. J., Vol. 191, Dec. J. A. M. A.]

Psychiatry of to-day, says May, covers a field which extends far beyond the walls of an institution, is of vital importance as a public health problem, and a subject of more than passing interest to every member of the medical profession. Psychiatry has of late years been recognized as constituting a subject of such importance that it merits more consideration from the general practitioner than it has heretofore received. As a rule, it is an essential part of the curriculum in the highest type of medical schools. Some knowledge of this branch of medicine is required now by the majority of state boards of medical examiners. The necessity of modern medical care in mental hospitals is becoming more and more apparent. A more general recognition and understanding of psychiatric medicine on the part of the practitioner is equally important.

BOOK REVIEWS

Kern, Benno, u. Schöne, Fritz. SONDERSTELLUNG GEWISSE
FARBTÖNE UND HEILBEHANDLUNG VON FARBENSCHWÄCHE.
[Ferdinand Enke, Stuttgart.]

Professor Albert Moll in Berlin has inaugurated a new series of monographs specializing in the field of "psychotherapy and medical psychology" a manifest precipitate of the enlarged interest taken by medical activities in this most important field of medicine. The present contribution is No. 2 of this new series and would deal with the recondite question of the influence of "light therapy" and "color discrimination" as influenced by practice.

The daily press and its attendant sensationalism has already saxophoned the "idea" which, from the scientific viewpoint, is still awaiting confirmation. Almost every reader of "Science" knows that cows that have been exposed to ultra violet rays give forth a milk which contains some kind of substance which is curative of rachitis, while unexposed cows give milk of no value for rachitically developed hens or other experimental animals. Thus Zoroaster and his sun worshippers are vindicated. Apart from such mythological, intuitively projected magic influences, here is a study that would seek to gain a more scientific basis for phototherapy and for light discrimination for the color blind.

In the successive editions of Jelliffe and White on diseases of the nervous system, more and more emphasis has been laid upon the energetic hypothesis. The cosmos in its many energetic manifestations provides the dynamics which runs all living matter. The human being is a transformer of this energy directed towards ego and racial goals. Light energy is one of the many forms which the body as a whole utilizes through optic receptors, and even more through melanophores of the skin, which as Bloch of Berne has shown, and as Müller of Hamburg is experimentally proving, influences the liver, the blood forming organs, and above all the adrenal system as vitally implicated.

Here is a monograph devoted to this general situation although limited to a minor sector in the whole situation, namely as to light impression of locomotive engineers as to their ability to distinguish signals of danger and safety, *i.e.*, red and green. Hence the development of the thesis along lines of color blindness and its importance in the economic life of the community. The reviewer is not quite sure whether he has grasped the meaning of the authors. At all events, he has cut the pages and gathered that much information about light impressions may be obtained in this annoying, provocative and stimulating monograph.

Liertz, Rhaban. HARMONIEN UND DISHARMONIEN DES MENSCHLICHEN TRIEB- UND GEISTESLEBENS. [Verlag Josef Kösel & Friedrich Pustel K.-G., München.]

Dr. Liertz, well known through his penetrating work, *Wanderungen durch das gesunde und kranke Seelenleben bei Kindern und Erwachsenen*, has made a still more thorough psychological study of mankind. He first explains the method in his field of labor, justifying and emphasizing the importance of "unlocking" the psyche through such investigations. His ability to approach his subject from all points of view leaves no room for narrowness of opinion or one-sidedness in purpose.

He views in broad and candid manner the fundamental dependence of the psychical life upon the physical intellectual striving of the human personality, which manifests itself in the form of the self-preservative and race-preservative instincts. Physical or psychical hindrances to development, environmental influences, and false attitudes in psychical self-discipline create the psychical disharmonies, depredations that are possible in the field of the self-preservative instinct. Organic inferiority or even wounded feeling of self leads to unsuitable psychical compensatory phenomena, to impossible guiding motives for conduct, and the setting of ever more and more limitations. On these the personality comes to grief, unless timely explanations and reëducation are undertaken. Dr. Liertz provides most valuable viewpoints for this work, especially in regard to children difficult of education, and toward the understanding of the youthful psyche.

The author treats the inhibitions to development which occur in the love life with courage and delicacy. He presents a most wholesome discussion of training for marriage, the recognition of the conditions for the building up of harmony, the discovery of the psychical values through which marriage should be the means of contributing to the harmony of the individual personality. He deals very practically with the question of instruction and training which will prevent the ills and sorrows of mismanaged love and broken marriages.

The book reaches its height in the author's discussion of the relation of mind and body. He sets forth and treats of a large number of the disturbances which may arise from the interrelation of the two. The book renders rich service for the understanding of the human personality and as a guide to its harmonious development.

Kretschmer, Ernst. KÖRPERBAU UND CHARAKTER. Vierte Vermehrte und verbesserte Auflage. [Julius Springer, Berlin, 1926.]

It may justly be stated that but few works which have appeared in the past ten years have been received with so much interest as this work of Kretschmer's. In four years, four editions have been prepared. There are some very valid as well as some equally unreasonable attitudes for this interest. In the first place the older Lom-

broso anthropological studies have mostly been forgotten, and hence a revised series of measuring units have come into vogue. Measurements always intrigue the masses who buy things by the pound, measure them by the meter and pay for them by some unit of value. Most human beings think thereby they "know what's what." This is a direct inheritance of the Virchow cellular pathology and the bacteriological thesis that a "bug" *causes* a "disease." Out of this has developed a constitutional pathology, not quite in the sense of Martius, or of Driesch or of Roux, but in the meaning that by exact use of some form of measurement by brass or chemical instrument, by figures, by tables, by charts, and by graphs, *voilà*, the mystery is solved.

On the mechanistic hypothesis that men are Robots, glorified machines, there you have it.

This is somewhat severe but this is the trend. This trend however is not without its value, just as Spurzheim's "bumps" were not entirely nonsense and it is to Kretschmer's credit that he has steered clear of the narrow "bump" situation and has enormously stimulated the whole psychiatric or "temperament" situation in very fruitful ways.

If Kretschmer's work is taken as indicative rather than as final—if showing the *trend* of association between structure and function rather than as dogmatizing, well and good.

Of special value are his measurements in showing the structural relationships which grow out of schizoid (schizothymic) and syntonic (cyclothymic) temperamental trends as registerable in bodily structure.

There have appeared in the last fifteen years many million words in the literature bearing upon the complicated efforts to distinguish the kaleidoscopic variations of symptomatology between what Professor Kraepelin offered us in his dementia precox versus manic depressive psychotic generalizations. With his seventy years, fortunately behind him, and the grand master of psychiatry still going strong, but few recognize better than he what a rumpus has been going on since he formulated his ideas about these two large psychiatric groups. From the anthropometric point of view Kretschmer has certainly given us some help, and yet it cannot be said we are out of the bog by any means, even with his help.

Without going any further—for fortunately Kretschmer's second edition is in English¹—we can say that no psychiatrist who pretends to know anything of the movement can afford to be without a knowledge of what he is trying to show.

Wechsler, David. THE MEASUREMENT OF EMOTIONAL REACTIONS. Researches on the Psychogalvanic Reflex. [Archives of Psychology, New York, 1925, pp. 181.]

Dr. Wechsler's book is an experimental study of the physiological expressions of the emotions, and in particular of the electrical reactions of the skin known as the psychogalvanic reflex. It is to the

¹ Published by Harcourt, Brace & Co., New York.

investigation of the latter that the greater portion of the book is devoted and to which the author's contributions are most significant. Especially noteworthy are his investigations of the reaction of the skin to currents of varying intensities, and the development of control methods of measuring the reflex. A new apparatus permitting automatic photographic registration of the phenomenon is also described.

Dr. Wechsler finds that of all the physiological indicators of emotion, the psychogalvanic reflex alone lends itself to reliable quantitative analysis and practical application. The reflex is an indicator of affective tone and may be used, according to the author, whenever it is desirable to ascertain the occurrence or absence of an affective reaction to a given stimulus. The intensity of the affective tone is roughly proportional to the magnitude of the galvanic response.

Among the special uses to which the galvanic experiment has been put are: (1) As a complex indicator in the association test. (2) To differentiate simulated hysterical anesthetics and analgesias from true ones due to organic lesions. (3) To differentiate stuporous manic depressive insanity from catatonic dementia precox. (4) In the study of exophthalmic goiter. Further suggested applications are in the study of the effects of drugs on the nervous system and in the investigation of hyper- and hypesthesias.

Of particular interest to the psychologist is the author's discussion of the nature of emotion. Dr. Wechsler distinguishes between what he calls the *physio-affective response* which includes such physiologic changes as alterations in the heart rate, variations in the sugar content of the blood, etc., and what he terms *behavior reactions*, such as running away from danger, wringing one's hand in grief, etc. He calls attention to the problem of the "specificity of emotional reaction," that is, as to whether individuals termed "emotional" may be expected to react uniformly in an emotional way irrespective of the nature of the stimulus or specifically to only certain types of stimuli or situations. On the basis of intercorrelations between reactions of subjects to various types of stimuli the author concludes that individuals tend to be "specifically" rather than "generally" emotional.

Those interested in the problem of the emotions and their measurement will find Dr. Wechsler's book both stimulating and useful.

Janet, Pierre. PSYCHOLOGICAL HEALING. A HISTORICAL AND CLINICAL STUDY. 2 Vols. [The Macmillan Company, New York.]

Were it not for the facility and charm of these pages we would speak of them as of secondary interest especially as they are old stuff. If any one should put out to-day as scientific the present day status of physical science by narrating what was known of it in 1904-1907, he would be laughed out of court. And yet a precise situation exists in the science of psychopathology. It has grown by leaps and bounds since 1904-07 and of all of these new acquisitions, save a sideslap at what he supposed to be was psychoanalysis,

which is but one of the newer psychopathological developments, here there is nothing of these newer formulations.

Janet gave some lectures in 1904 in America, repeated and added to them in various places up to 1907 and these interesting but wordy books are the result. As stated, he has incorporated some misinformation and total misunderstanding of Freudian conceptions, chiefly his strongly criticized paper of 1913 read at a psychological congress in England upon the subject of psychoanalysis where it was forced upon him to say he did not read German (Janet married a Strassburg woman), and hence had obtained his knowledge of Freud second-hand.

One can obtain an excellent historical résumé of some aspects of psychological healing up to the year approximately of 1890, when Janet, himself, elaborated his doctorate thesis on Psychological Automatism. His chief discussions center around popular presentations rather than the scientific discussion of the deeper principles of the dynamics involved.

When these lectures were given they were delightful, but to hatch them out into English after nearly twenty years hardly seems justified.

Waller, Joseph R., Kaatz, Moritz, and White, M. GERMAN ENGLISH MEDICAL DICTIONARY. III Edit. Fifth Edition. [Franz Deuticke, Leipzig and Vienna.]

Although not as extensive a medical dictionary as the Lange-Meyer German-English medical dictionary it has the great advantage it can be slipped in the pocket and made available where a larger work is more cumbersome. Such a work is extremely useful since the renewed activities in the German medical sciences render it necessary if one would keep in touch with the numerous discoveries issuing from the German hospitals and laboratories.

Freud, S.; Grote, L. R. DIE MEDIZIN DER GEGENWART IN SELBST-DARSTELLUNG. [Felix Meiner, Leipzig.]

We have had occasion to speak of this interesting series of autobiographies of physicians of note in speaking of Ziehen. The present series contains six excellent short life histories; Gottstein of Berlin, Heubner of Dresden, v. Kries of Freiburg, Much of Hamburg, Ortner of Vienna, and of chief interest to neuropsychiaters, Sigmund Freud.

Here is a condensed autobiographical account which throws a special light upon the personality of this most important inventor or discoverer of valuable concepts and ideas the which have proved reconstructive in all of the mental sciences.

Here one may read of Freud's early life, his work in physiology in Brücke's laboratory, where he conducted some experimental observation upon the oblongata in *Petromyzon*. His early work on the nervous system in Meynert's laboratory and his efforts at teaching organic neurology in Vienna are briefly sketched. He rather grimly tells a joke on himself when he says he knew nothing of the neuroses

at this time, and was deep in the mysteries of localization in organic neurology. While giving some "pidgin English" courses to American students at this time he discussed an ordinary neurotic fixed headache as a circumscribed meningitis, which being critically received by his students tended to destroy his usefulness in this capacity of popular teacher.

In the autumn of 1885 he went to Charcot and became a pupil and inasmuch as he began a series of translations of Charcot's works into German was able to enter closely into the circle surrounding Charcot at the time. He very clearly states, in commenting upon certain critics, especially French, who have written that Freud got his ideas from Janet, that Janet's name was not even known during the time of his stay in the Salpêtrière. In fact Janet at this time was twenty-six years old (born May 30, 1859) and was teaching philosophy and letters in a high school at Havre. His doctorate of philosophy thesis was presented in 1889 (*L'Automatisme Psychologique*), the earliest suggestions of which as Janet states in its preface began in the year 1886 and were published in the *Revue Philosophique*, *Revue Scientifique* in this year. He expresses his thanks to the physicians of Havre where he had been for some time as to his indebtedness to them for his material. Phenomena of somnambulism, studies in hypnotism, study on Malbranche all are studied in this year and a Latin thesis for a degree in letters in 1889. Janet was not a physician, taking his medical degree later in 1893. His Salpêtrière conferences began in 1893 (*Arch. de Neur.* 1, 373, II, 29, 448), when he was invited by Raymond to work in clinical psychology. [J.]

Freud's work with Charcot is most attractively sketched and then follows his association on his return from Paris with Kassowitz in Vienna, and his classical works on brain diseases in children. Freud was thirty years of age at this time—beginning his married life. He humorously relates what has been outlined in his *Traumdeutung* how he missed out in not being the discoverer of the anesthetic properties of cocaine. Koller to whom Freud had spoken of the action of cocaine upon the eye, actually carried out some planned experiments and has been given the credit.

Freud's recital of how the Viennese doctors took his reports of the work in Charcot's clinic is most interesting and illuminating. One surgeon remarked—apropos of a demonstrated case of hysteria—"Hysteron means uterus, men don't have uteruses, therefore men don't have hysteria!" One hears the same sort of "stuff" every day still about psychopathological situations.

Concerning Freud's further life we must refer the reader to this unusually revealing autobiography.

Jacobsohn-Lask, L. *DIE KREUZUNG DER NERVENBAHNEN UND DIE BILATERALE SYMMETRIE DES TIERISCHEN KÖRPERS.* [S. Karger, Berlin.]

This crossing of nerve pathways has always been a captivating problem, not only as it has been observed in the larger system

crossings as the sensory and pyramidal pathways, but in shorter segmental crossing and recrossings as are present through the whole cerebrospinal axis in vertebrates.

Professor Jacobsohn-Lask has in Vol. 26 of the Bonhoeffer Monograph Series given a thorough treatment of this much discussed series of problems, and in a very succinct and satisfactory manner.

He details the earlier conceptions of Wundt who he says was really the first to seriously attempt to solve the problem, then Flechsig's ideas and Cajal's earlier interpretations. Then follows Wundt's return to the problem and Spitzer's ingenious utilization of invertebrate material to clear up the conceptions. Finally he takes up his own efforts after a short presentation of Radl's work.

The details are of interest to anyone who has not settled the problems by *a priori* methods.

Sorrel-Dejerine, Mme. CONTRIBUTION A L'ÉTUDE DES PARAPLÉGIES POTTIQUES. Essai sur L'Évolution et le Prognostic, basé sur 40 Observations Personnelles. [Masson et C^{ie}, Editeurs, Paris.]

This excellent "Thesis" is of more than usual interest. Primarily it attracts our attention by reason of its intrinsic merit as a scientific document, but with this there is mingled a personal note of no small importance. The authoress is a daughter of two distinguished workers in the field of neurology, Professor J. Dejerine, known as an international figure in neurology and his no less equally distinguished wife, Mme. Dejerine, his collaborator and independent investigator. Married to a surgeon of great promise, chief at a maritime hospital chiefly devoted to the care and treatment of tuberculous children and adults, this gifted daughter has here presented a series of studies drawn from this hospital service.

Paraplegia as it occurs in Potts' disease has not been without numerous valuable studies, but it can be said but little attention has been seriously devoted to special features in its clinical types, their evolution and especially the prognostic features upon which an efficient therapy may be founded. Why is it that certain of these paraplegics recover, and what are the factors which seem to determine their chronicity and unrecoverability? Are there definite clinical signs which offer solutions to these questions? These are problems towards the solution of which Mme. Sorrel-Dejerine has directed her attention and in a study of forty personally observed cases, some of which have come to autopsy—carried through a period of four years, has formulated some very important conclusions based upon this experience in her husband's service at the Berck Hospital.

The material divides itself into a series of cases: (1) A transitory form in which the paraplegia is transient, persisting for some weeks and recovers without sequelæ; (2) a curable but more subchronic form which persists about eighteen to twenty-four months and (3) a form with chronic evolution.

The clinical features which offer special prognostic indications are presented as follows: (1) The curable paraplegic group comprise

chiefly those that appear very early and which develop a complete paraplegia very rapidly. Although the clinical signs are of a serious nature, inasmuch as these are conditioned chiefly by the formation of an intraspinal abscess, or when even more evanescent, upon a simple edema of the vertebral walls, their better prognosis is thus explicable. The second group of subchronic cases comprise those which develop their paraplegia later, and more slowly and less completely and which evolve irregularly for months or even over a period of one or two years. These are due usually to pachymeningitic lesions, to bony sequestrations, or to vascular lesions consecutive to spinal cord compression of a particularly prolonged or intense nature.

Thus one is able, neurologically speaking, to offer some prognostic opinion when called upon in the presence of a paraplegic Potts syndrome. From the study of these 40 observations involving children as well as adults, it appears that cure is as frequent in adults as in children and that age is not a factor of grave importance as regards the paraplegia.

In precocious paraplegics, of rapid onset, and total as to clinical signs, those who may be treated by *strict immobilization* cure can be obtained in as high as 90 per cent of the cases. In the later appearing paraplegias of slow evolution, progressive and with crossed signs, cure has never been observed and these forms are present in those Potts' disease cases which have never been immobilized, or those patients who have continued to walk with a corset.

In the first chapter of this thesis anatomical-pathological factors are discussed. These are illustrated with many macroscopical and microscopical photographs in which the different causes for paraplegia are shown. In certain patients intraspinal abscesses are evident as causative factors. These separate themselves and thus preserve the spinal cord from further destruction. Others illustrate the involvement of the dura mater by pachymeningitic processes, while others illustrate the consequences of bony sequestratæ.

In the second chapter Dr. Sorrel-Dejerine develops the symptomatology and evolution of the paraplegia of Potts' disease with particular attention devoted to the neurological syndrome. Thus the motor, sensory and sympathetic (pilomotor reflexes of spinal and cerebral levels) signs are brought out and further differentiated in relation to their metamerical localization.

In the succeeding chapter special attention is given to the study of the c.s.f., and other localizing features are investigated by the use of lipiodol which bring into photographic relief the progress of the disease whether as progressive, regressive or as on the road to complete recovery.

Chapter IV deals with questions of diagnosis. Positive signs are muscular contractions, gibbosities, and the results of radiographic-lipiodol pictures. Differentiated diagnostic features as related to vertebral carcinoma, intraspinal tumors and syphilitic paraplegias are also considered and their questions of metamerical diagnostic importance are taken up. These are illumined by the radiography-lipiodol

studies and by the motor, sensory and sympathetic (pilomotor) signs, and the defense reflexes of Foix.

In a final chapter treatment is taken up. Here the definite conviction is expressed that in the treatment of Potts' disease, if paraplegic disasters are to be avoided one must aim towards absolute immobilization of all cases. In at least 92 per cent of all cases the serious paraplegic syndromes have occurred when this rule has been relaxed.

Paraplegias which have developed on the basis of edemas or intraspinal abscesses recover with such frequency that direct surgical intervention is contraindicated, also those developing upon the basis of a pachymeningitis. Strict immobilization is the first type of treatment to be followed. Further, the hygienic influences of sunlight (helio marine) contribute the most favorable factors for reparation and possible cure. [J.]

Wimmer, August. MEDDELELSER FRA UNIVERSITETETS PSYKIATRISKE LABORATORIUM. Vol. III. [Levin u. Memksgaards Forlag, Copenhagen.]

Vol. III of Professor Wimmer's collected papers from his Copenhagen Clinic follows the plan so well known to us of binding the various reprints of papers contributed by his assistants and students in one volume.

The present one has 37 papers. It would be impossible here to signalize them all. Krabbe has an interesting communication upon Argyll-Robertson pupil in a nonsyphilitic epidemic encephalitic and with Wimmer an important contribution on the c.s.f. in multiple sclerosis. Axel V. Neel contributes some valuable clinical studies on encephalitis, and Professor Wimmer himself has 15 papers, all of much interest and value to students of neurology and psychiatry. Danish, French, English and German are intermingled in these communications, the most striking for the present being a series upon mesencephalitic syndromes.

Bleuler, E. DIE PSYCHOIDE ALS PRINZIP DER ORGANISCHEN ENTWICKELUNG. [Julius Springer, Berlin.]

When it is definitely remembered that man in his phyletic inheritance of experience contains the accumulated wisdom of a billion years, even though his knowledge may at best only comprise but a few score of this span, it is not to be wondered at that when it comes to get at the guiding principles of this mnemonic inheritance he should have to flounder about in fiction after fiction in his effort to encompass this magistral fact.

Hence this effort of Professor Bleuler in the erection of a new concept which he has named "The Psychoid." By this he would mean the "soul within the soma" if it can be so crudely expressed. It is of a higher order, maybe, if we understand it, although analogous to the Psyche which concept heretofore has apparently functioned. The functions of the psychoid are distributed in every cell of the body, and yet can work as a unity rather than as a community of

these single aspects. It works more or less parallel with the Psyche—which latter Bleuler speaks of as cortically synthesized, whereas the Psychoid represents a mnemic synthesis of the entire nervous apparatus.

Difficult as it is to comprehend just how to pin these conceptions into simpler frames Bleuler has here given a very stimulating work which throws an arc light upon many difficult problems of psychopathology.

This work, with his "Natural History of the Soul," indicates the ripened products of a master mind in this special field and one could wish to have this work as well as the other put into a form understandable to English speaking workers. The book is comparatively small, 152 pages, but is filled with valuable ideas.

Bolten, G. C. UEBER GENESE UND BEHANDLUNG DER EXUDATIVEN PAROXYSMEN. (QUINCKESCHE KRANKHEIT, MIGRAINE, ASTHMA, ETC.) [S. Karger, Berlin.]

Dr. Bolten of the Hague has been contributing a series of scholarly studies upon the exudative paroxysmal type of phenomena, now for some years. In this, No. 31 of the Bonhoeffer Abhandlungen, he has brought these studies to a 100-page monographic presentation.

Dr. Bolten's chief foundation is a biochemical one. Metabolic factors are determiners and hormones acting upon the vegetative nervous system are made the God in the machine. The general formula is a hypersympathetic tonus of the blood vessels that gives rise to the type of phenomena under consideration. Organ predisposition is made responsible for localization and inferior organ heredity is involved in the causal chain.

It is a very scholarly and sound presentation from the standpoint of a logic which regards the "body as a whole" as of less moment than the autonomy of organs and that disregards man as being primarily a herd animal and hence most under the stress of his adaptative necessities.

Thus autonomous man, autonomous organs, autonomous hormones, and hereditarily segregated inferior structures—these are the fictions underlying the logic of this presentation. To us therefore they present only a purely structuralistic series of hypotheses—even though the author makes frequent gestures that psychological and sociological factors are often at work—that they are always necessary and that the psyche is as old as the soma is not reckoned with and hence makes us feel that the author has not progressed very far into the complete presentation of all of the level activities of the human body as bearing upon these very important situations.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

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ORIGINAL ARTICLES

REGULATED ACTIVITIES

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Life, in spite of the progress made in describing the various properties of living organisms, remains an enigma. Up to the present time man has only succeeded in describing the properties of living organisms expressed in relations established, and maintained with the environment.

An interesting, and at the same time, one of the most difficult features of the relationships to try to explain is the phenomenon of regulation. A dominant characteristic of all vital processes is that they are regulated. Regulation is responsible for the integrated, unit-like reactions of living organisms, composed of numbers of diversified parts. As organisms grow, they tend to create and maintain unified and regulated activities. Although we recognize the principle, it is not necessary for us to consider regulation to be what Grasset has called "the biological finality" of all living organisms.* We may accept the evidences of the existence of some kind of regulation without attempting to explain the reason for its existence.

One reason why we experience so much difficulty in studying the regulation of the higher and more complicated forms of human activities is that so little attention has been paid to describing the simpler forms of regulation existing in the embryo. We are continually embarrassed in trying to find satisfactory explanations for relations adult organisms form with their environment, because we are so ignorant about the relations established by the embryo within its limited and restricted environment.

* Maeder, A. Schweiz. Arch. f. Neurol. u. Psychiat., Bd. XVI, H. 2, 1925, S. 198.

The regulatory arrangements influencing life include processes operating both before and after the appearance of the nervous system. Unfortunately we know relatively little about the mechanisms existing before the nervous system has developed.

The control of activities during the first epoch of life depends directly upon the physico-chemical properties resident in protoplasm. We cannot expect to make much progress in getting an insight into the nature of these early regulatory mechanisms until more information about the composition of protein matter is available.

It would be difficult to overestimate the importance of continuing investigations into the nature of protoplasm in order to throw light upon the variety of the factors responsible for the rhythmic character of the vital processes. The preservation of the normal rhythm of the vital processes is doubtless of great importance in determining success or failure of the adult in the dance of life. Interference with rhythmic activity increases the difficulties in the integration and co-ordination of reactions at all levels of adjustment. We are still pretty much in the dark about the nature of control exercised over the primitive rhythmic activities. In addition to rhythmic variations, there are also changes in amount of delay, inhibition and modifiability of reactions. The capacities for increasing the length of delay, as well as directly inhibiting and modifying reactions exist before any differentiated nervous system appears.

It is not necessary to spend much time in stressing the fact that the reactions, apparently simple as well as complicated ones, by which organisms constantly form new and extended contacts with the environment are really exceedingly complicated phenomena. The remarkable degree of integration responsible for the simplest reflex tends to divert attention from the great complexity of this form of response. The promptness and effectiveness with which reflexes accomplish their purpose in protecting the organism may also serve to turn attention away from the question of the multiplicity of factors responsible for their occurrence.

Biologically considered, the reflex should not be taken as the functional unit of response. Reactions occurring before the development of the nervous system are simpler than the reflex, and therefore should be selected as the real functional units of response.

In studying even the simplest forms of response, we should remember not to consider the reactions as local affairs. Even primitive movements cannot take place if the activities of the entire organism have not reached a certain degree of integration. Instead of being local affairs, the early movements of the embryo show an extraor-

dinary capacity to spread, and this tendency to radiate is more or less characteristic of all adjustments occurring at this time of life. This is a feature of embryonic responses to which Minkowski¹ has directed special attention. Every form of reaction is the result of profound changes, not merely of a local character, but of those disturbing the entire general equilibrium of the body. To give a complete and satisfactory answer to the interrogation, "How do these responses occur?" would be equivalent to answering the question, "What is the nature of life itself?"

We are altogether too much inclined to discuss the reaction of living organisms as if they were purely local affairs. We have become so accustomed to draw diagrams, in order to illustrate the character of the mechanisms concerned in the production of reflexes or automatic movements, that the habit of striving for pedagogic simplicity has closed our eyes to the relations, meaning, and purpose of the movements of the living organism.

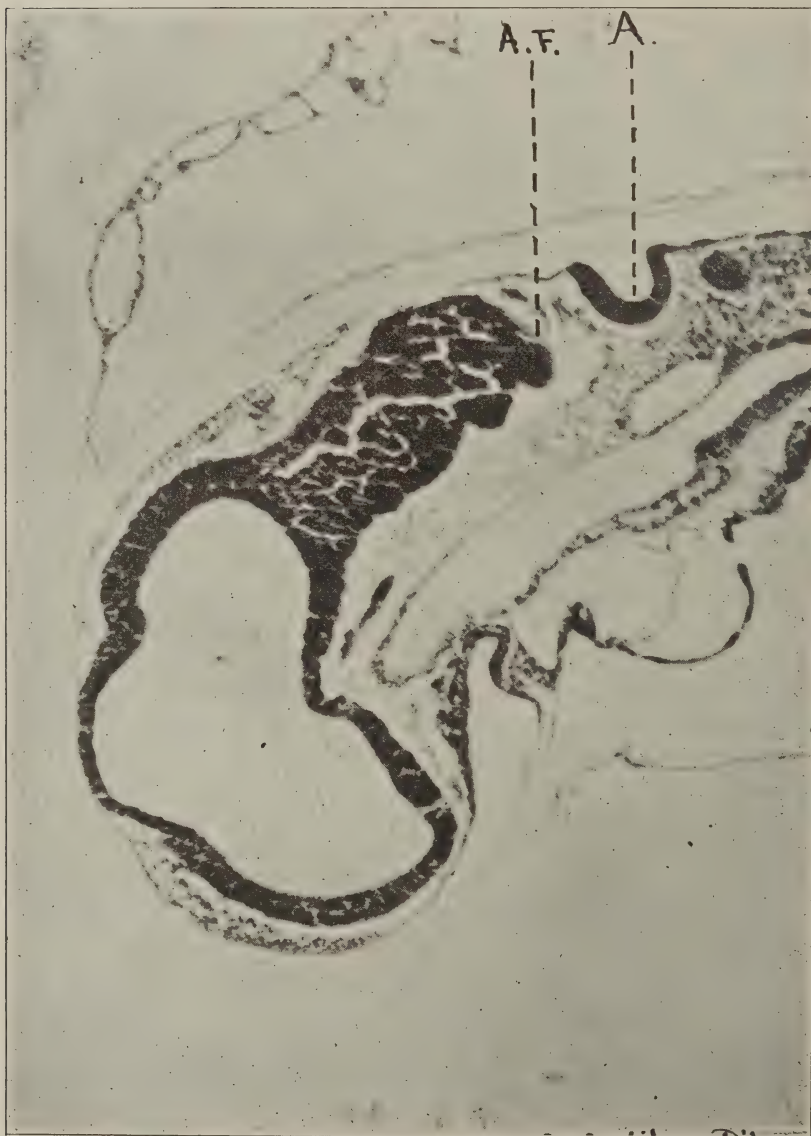
Of course it is a very interesting problem to try to determine just when and how the nervous system begins to regulate activities. Let us consider first the case of the heart, which in the chick embryo, begins to pulsate feebly and irregularly at about 30 hours of incubation (10 somites). It has long been known there is no evidence that at this early stage the rhythmic activities of the heart are in any way under the control of nervous mechanisms. The first neuroblasts and neurofibrils are found near the place indicated in photograph No. 1. These elements appear only in the medulla, and as yet do not have any connection with the heart. At the time of the first incidence of cardiac pulsations there does not seem to be any chance even of unrecognized, but potential neuroblasts having migrated to lie in contact with, or actually within the walls of this organ. After the conclusive observations of W. H. and M. Lewis in regard to the contractile powers of bits of isolated tissue, there is not any reason for assuming that the first cardiac pulsations are in any way dependent upon nervous control.

We are not able to say exactly at what time the control of the heart is actually taken over by the nervous system. Probably the repressive or inhibiting influence of the vagus nerve is felt before the accelerating stimuli transferred from the sympathetic reach this organ. If some restraining influence was not exercised, the heart would soon wear itself out. Provision is made early in the life of the embryo to prevent unnecessary waste of vital energy. In photo-

¹ Minkowski, M. Zum gegenwärtigen Stand der Lehre von den Reflexen. Abhandlung aus d. Schweiz. Arch. f. Neurol. u. Psychiat., Heft 1, 1925.

graph No. 3 we see in a chick embryo, 120 hours incubation, the

PHOTOGRAPH No. 1



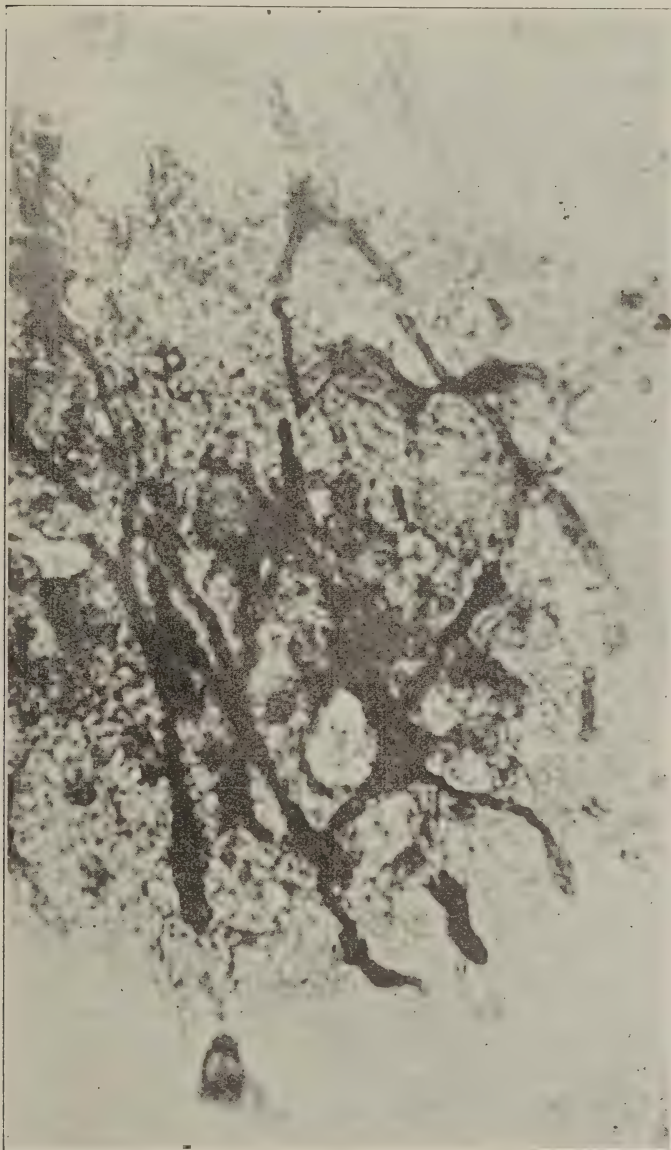
Chick 17 somites.

A.F. Acoustic-facial nucleus. A. Auditory pit.

large bundle of the vagus nerve lying close to the wall of the heart. Here then is ample machinery to apply the brakes to the heart. The

inhibitory mechanism, however, is not simply the result of control

PHOTOGRAPH No. 2



Acoustic-facial area, Photograph No. 1. Magnification $\times 1000$.

introduced by the nervous system. Usually we think of inhibition as including a group of processes that are dependent upon the existence

of a nervous system. This view, however, does not take into account all the different elements contributing to the process of inhibition. There is a certain amount of inhibition present before the nervous system is differentiated. The pulsations of the heart, for example, are the result of the action of two antagonistic factors, namely excitation and inhibition; and the resulting rhythmic activities are due to the relative degree of equilibrium established between these opposing forces. Prior to the appearance of the nervous system the inhibiting influences cutting down the activity of the heart are directly due to physical-chemical changes. The classical researches of Alfred G. Mayor on the pulsations of the jellyfish gave some indication of what the nature of these inhibitory influences may be. It is not only true, as Howell² has pointed out, that the inhibitory nerves of adults inhibit by the production of inhibitory substances, but in all probability inhibitory substances are produced in the embryo the minute the heart begins to pulsate, and this primitive regulatory mechanism without the intervention of a nervous system prevents cardiac overactivity.

After the nervous system is developed, the capacity for inhibition is increased, just as is the capacity for excitation. The intervention of the nervous system in all probability does not introduce any new function. If it is true, that the vagus nerve produces and liberates inhibitory substances, this function is to be regarded merely as the extension of a function operating before differentiated nerve tracts exist.

What has been said about the effects of the inhibitory influences of the vagus upon the heart probably also applies to the stimulating effects of the parasympathetic fibers. Excitation is caused by the production of chemical substances stimulating nerve endings.

Complex neural arrangements exist prior to the time when incident stimuli, electrical, pain, pressure, begin to give unmistakable signs of producing prompt responses in the shape of movements of limbs and body. It is a very striking fact that extensive though incomplete preparatory arrangements have already been made at this time to get the animal ready for flight, or withdrawal from sources of irritation that would undoubtedly be harmful. Evidently the preparation on the structural side is far in advance of function.

I have already mentioned the fact that the first appearance of neuroblasts is noted in the neighborhood of the acoustic-facial nucleus—the area of the acustico-facial crest. In embryos that have reached the 17-somites stage of development, a collection of neuro-

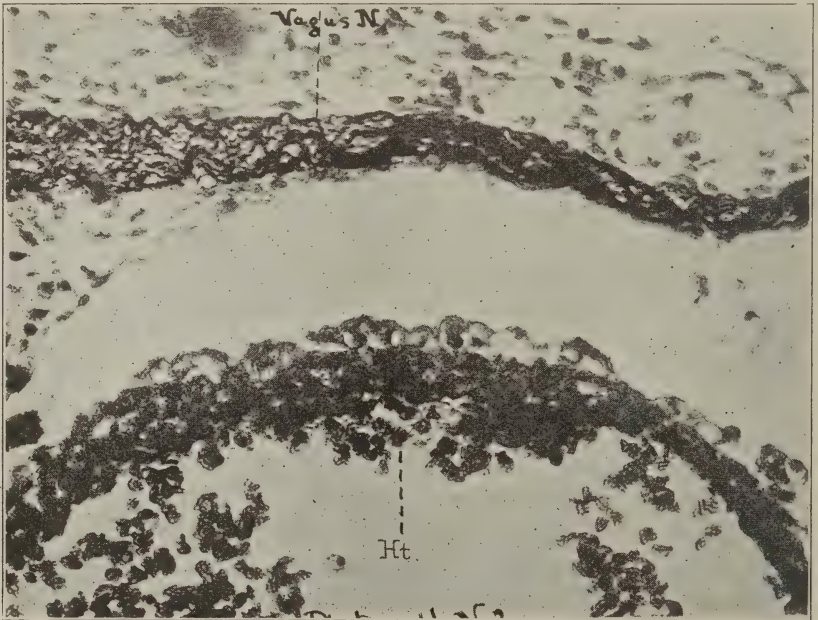
² Howell, Wm. H. Inhibition. *Physiological Review*, Vol. V, No. 2, p. 176.

blasts and neurofibrils appears at the point already indicated in photograph No. 1; and these particular neural elements seem to be the earliest to be differentiated in the entire nervous system. These neuroblasts are evidently derived from the lateral ectoderm of the head. In cross-sections, photograph No. 3, at the 16-somite stage in the same area extending caudad, probably as far as the vagus centers, we see a few cells sending their axons in a ventral direction in the outer marginal zone. These neuroblasts are situated in a dorsal position, where we expect to find the nuclei of the N.V. VII, IX, X and XI. Probably the fact that the nerves from this region have had connections with visceral arches, and do not supply myotonic muscles may be a point in their phylogenetic history that gives the clue to the precedence they take in development. The axons of these cells have not yet reached the middle line so that connections do not yet exist by which regulatory control of neural elements can become effective.

Of course it is interesting to speculate as to the forces operating to bring about the differentiation of neuroblasts and fibrils at this particular point and time. Do the distribution of blood vessels and the pulsations of the heart have any direct influence in starting up the growth of nerve cells and fibrils in what seems to be such a well chosen location for the first centers of nerve control? To what extent are we justified in seeking for the primary causes responsible for differentiation in the circulatory development? What factors are responsible for producing the acustico-facial prominence, and later for the actual differentiation of nervous tissue at this particular point and time in the life of the embryo? It will be remembered that as Lilley and other investigators long ago pointed out, the acustico-facial periaxial cord is much more pronounced at this time than the trigeminal. In the latter region the cells which probably later become neuroblasts are more widely dispersed. The condensation of cells, apparent in the acoustic facial primordium, in the case of the trigeminus, takes place later. Until we can account for the prominence of the acoustic facial area we shall have to be exceedingly guarded in deciding just what forces operate to start up the process of differentiation within this particular area. In reviewing the phylogenetic history of the vertebrate we have no difficulty in finding facts that seem to explain why this particular area becomes the starting point of the nervous system. The acoustic-lateral region, from fish upwards in the scale, receives plenty of nerve tracts from lateral line organs as well as from the internal ear. Within this area there is, as Herrick points out, a region of incomplete localization, but at the

same time in spite of this incompleteness all the reflexes included in the acustico-lateral complex are from the physiological standpoint closely related; and hence it follows that all mechanisms necessary for the maintenance of equilibrium, posture and for the transmission of vibratory as well as auditory impressions have become centered within one area.

PHOTOGRAPH No. 3



Chick, 120 hours' incubation.

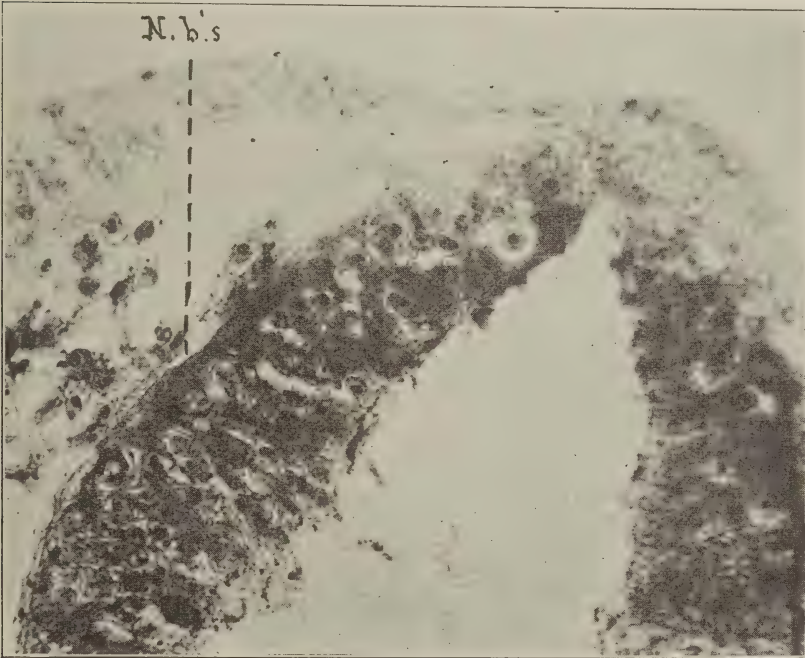
The relation of the first neuroblasts in this area to the posterior longitudinal fasciculus is an interesting question; particularly in view of the opinions expressed by Bok³ and Ariëns Kappers⁴ on the subject of neurobiotaxis. Although it is probable that the phenomena of neurobiotaxis as described by these two investigators are important factors in determining the development of neuroblasts, we believe that other influences have to be taken into account in starting up the process of differentiation. The development of the circulatory system and the distribution of blood vessels to this region of the medulla

³ Bok, S. T. Die Entwicklung von Reflexen u. Reflexbahnen. Overgedrukt int de Psychiat. en Neurolog. Bladen Jaargang, 1922, no. 3 en 4.

⁴ Kappers, Ariëns, C.U. Phenomena of Neurobiotaxis in the Optic System. Madrid, 1922.

may turn out to be of considerable importance in bringing about the differentiation and growth of neural elements at this particular point. The complete explanation of differentiation and growth of nerve cells and neurofibrils probably cannot be attributed to any one set of factors. In addition to the neurobiotactic influences, as well as those attributable to the circulatory system, we may be com-

PHOTOGRAPH No. 4



Cross section. Chick 19 somites. First neuroblasts to be differentiated.

pelled, in seeking for a complete explanation, to fall back on a whole series of events in the entire life history of the organism. This latter view is the one suggested by the important series of investigations carried on by Coghill in his very careful study of amblystoma larvae. The results of my studies on chick, rat and guinea pig embryos all tend to confirm the observations recorded by Coghill in regard to the general pattern of differentiation. The major features of this pattern are anticipated in the initial stages of differentiation, whereas visceral and somatic systems are differentiated as the result of the participation of the nervous system. It is worth noting that

both McClure and Butler, as the result of their investigations upon the circulatory system, have come to the conclusion that we should be very careful in attempting to explain any of the phenomena associated with growth to any single factor.

We have indicated the point at which the earliest differentiation of neuroblasts begins. The process of differentiation is continued frontally until we reach the level of the third nerve, and here the process abruptly ends. There is no indication of neuroblasts or fibrils appearing beyond this area. Between the point of emergence of the third nerve from the medulla and the levels occupied by the vagus nerve the development of the nervous system proceeds most rapidly during its initial stages of growth.

Photograph No. 4, the chick embryo of 19-somites, shows the emergence of N. III. Our observations substantiate the results of Tello's⁵ studies showing that the differentiation and development of this nerve precedes that of N. IV. The oculomotor common tract is first formed, and then is followed by the external and internal bundles in the order named. Tello also discusses the question of the relations existing between the pathways formed for the 4th N. and the superficial veins. In the mouse the axons follow the nearest small veins, and there seems to be a close connection between the direction of growth of nerve bundles and the blood vessels, suggesting the existence of active stereotropic influences.

As I shall show presently, the extent of the preparations made in the nervous system to assume control before the various organs and parts of the body have been used seems to be a good reason for preserving a conservative attitude in selecting any single group of factors as directly provocative of differentiation of structure.

Here I wish to introduce a word of caution in attempting to describe the responses of the embryo. The fact that the investigator, in order to meet with success, has to formulate and attack specific problems representing special phases of a very large subject, frequently compels him to direct attention so exclusively to one phase of a reaction that he is apt to forget a perspective is as important as details in judging the nature and significance of processes. The special interest aroused, in the study of nervous reactions has often prevented investigators from realizing the extent of the biological problem connected with researches conducted to determine the nature of nerve impulses. The narrative of events taking place in the development of the embryo if properly interpreted should convince

⁵ Tello, J. Francisco. Observations sur le développement du nerf pathétique. C. R. des séances de la société biol., 1924, XCI, 811.

us of the undesirability of trying to discuss the amount of regulation involved in the integration of functions by the nervous system as phenomena capable of being isolated from other biological processes responsible for growth.

In order to illustrate the value of acquiring thoroughly comprehensive points of view in discussing even primitive reactions, let me recall briefly some prominent events in the development of the embryo. Let us consider what takes place in the chick on the 6th day of incubation. At this particular time the first unmistakable evidences of the effects of external stimulation may be noted. If a fine electrode is placed at the neck, and a relatively strong current sent through the circuit, a slow sluggish movement of the wings is noticeable. Judging from the character of the reaction, a sluggish response without any snap, there does not seem to be any reason to suppose that the nervous system even yet has become of any great functional importance. The exceedingly deliberate character of the reaction suggests that the current spreads through the tissues and induces a response without passing directly through nerves.

The nature of this primitive response, as I have already said, has certain points of interest for us. In the first place it is evidently one of the first movements connected with flying and therefore suggests the first link of what later becomes a definite protective form of reaction. As is usually the case in all these primitive movements, the motion away from the body does not seem to be opposed by any antagonistic response of flexor muscles. The return of the limb to its original position has all the appearance of being a passive movement. About twelve hours later if the same stimulus is applied in addition to the raising of the wings, we notice a slight extension of the legs.

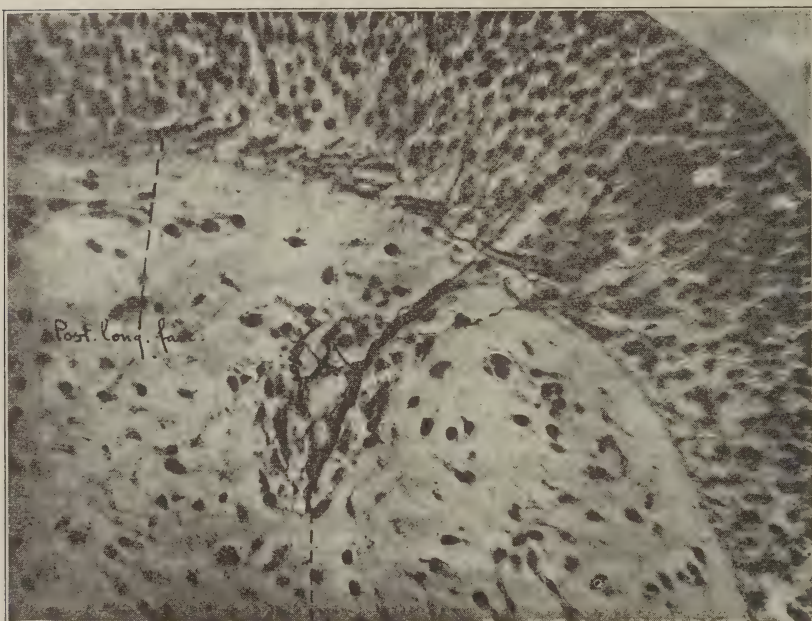
As in the case of the heart, these primitive responses of limbs are at first exceedingly feeble and are associated with a flaccid state of the muscles. Evidently a very low degree of tonicity exists. When we see the relatively slight response and then think of the complicated differentiation already existing in the nervous system, we are surprised that structure has developed so much more rapidly than function.

From the moment when these first reactions of the skeletal muscles appear a progressive development in functional complexity is noticeable. The movements become more pronounced, the response following the incidence of stimuli is quicker, and the tissues do not seem to become so quickly fatigued. The movements recur only a very few times if the stimulus is repeated, then quickly cease, and

do not reappear again until considerable time for recuperation has elapsed.

One point deserving special consideration is that the extensive arrangements made to take over the control of the primitive reactions are not confined to the nervous system. In the endocrine organs we see remarkable evidences of advanced preparation for these organs to begin their functioning. Bundles of neurofibrils are seen pene-

PHOTOGRAPH No. 5



N. III
Sagittal section.

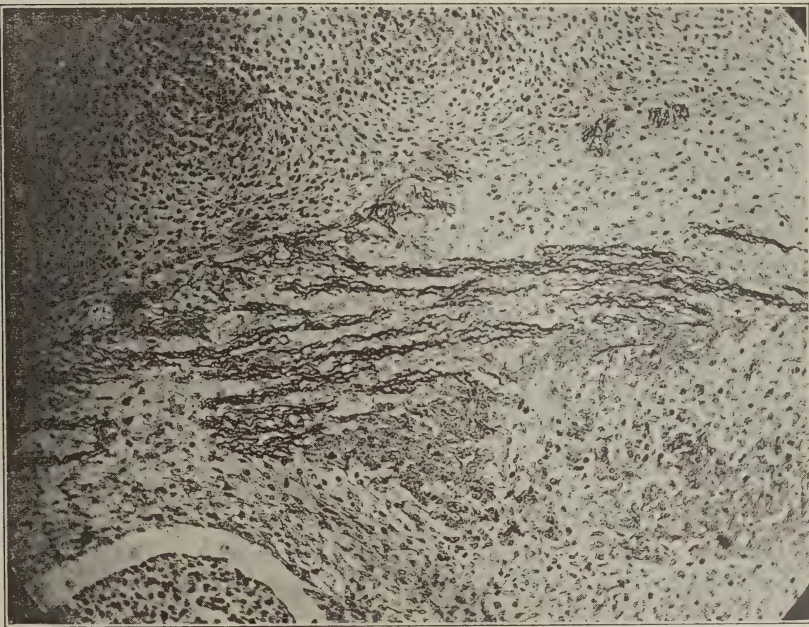
trating into the region of the thyroid in the chick embryo of 120 hours incubation. In cross sections through this region enormous numbers of neurofibrils can be seen finding their way in among the cells.

Evidently at this time the development of the sympathetic nervous system in the adrenals has advanced rapidly. It is quite possible to distinguish the sympathetic ganglia, and to see that they have extended cranially as well as caudally, and form a continuous chain. Particular attention has been given by Rau and Johnson⁶ to the

⁶ Rau, A. Subra, and Johnson, P. H. Observations on the Development of the Sympathetic Nervous System and Suprarenal Bodies in the Sparrow. *Proc. Zool. Soc.*, 1923, pp. 741-768.

various steps of differentiation in the adrenals of the sparrow. A survey of the conditions, comparable with those in the chick, as given by these investigators, shows how rapid and extensive the growth of these organs has been just before the time when the capacity of the embryo to speed up and reinforce its movement is first noticeable. Even a slight acquaintance with the series of events taking place

PHOTOGRAPH No. 6



Chick 120 hrs. incubation. Great development of sympathetic in region of suprarenals.
Sagittal section.

during growth shows the variety and extent of changes in the vascular, muscular, and nervous systems, and brings out the complexity of arrangements made to transmit nerve impulses. As the neural crest becomes detached and its different parts penetrate the spaces between myotones and the neural tube, groups of neuroblasts are formed that wander ventrally to take positions near the aorta. The chain of neuroblasts from the sympathetic are located metamerically at intersomatic points. The neuroblastic elements have their origin either in the neural crest, the dorsal ganglia or in their migration have followed pathways that are closely related to the motor roots. The primordial ganglia extend, as did the original neurofibril bundles

in the medulla, both cranially and caudally. At the same time dorso-lateral extensions take place from the ganglia, and serve as nuclei for the permanent sympathetic ganglia, which also extend both cranially and caudally. Cells from the same origin supply sympathetic ganglia, the chromaffin cells of the medulla of the suprarenal bodies, as well as coeliac and other important ganglia.

About 3 or 4 hours after the heart begins to beat (32-33 hrs.) in the chick the neural crest which plays such an important part in the development of the sympathetic stretches from the dorsal almost to the ventral border of the cord. At 42-44 hrs. very active proliferation of cells, destined to form part of the sympathetic system, is going on and one can readily distinguish cells possessing some of the characteristics of neuroblasts. Cells with similar characteristics can also be seen among the migrating elements from the ventral roots. Incidentally it is worth noting that the positions occupied by these migrating cells evidently are influenced, as Rau and Johnson have stated, by the segmental arteries and veins. Here again as in the medulla there seems to be evidence of causal relations existing between the appearance of differentiated neuroblasts, and the increase in the vascular supply of these parts.

In an early stage of this differentiation, when only the primary sympathetic chains are formed, it is impossible to detect any positive evidence of the existence of chromaffin cells. At this time of course there is the possibility of cells from the sympathetic having reached the heart, although they cannot be recognized. The heart however possesses only a very limited capacity for increasing its rate of pulsation, so that an extensive machinery for reinforcing the beats does not exist. In the 6-day chick, the conditions in the nervous system have changed considerably. The secondary sympathetic chains at this time are completely formed while connections between the primary and secondary chains are already diminishing. One point about the growth of the sympathetic in connection with the adrenals that is particularly worth noting is that in the 84-hour chick the process of proliferation is very active in the region of the posterior mesial commissure; just near the area occupied by the suprarenal bodies. This connection is important as it suggests that some kind of functional relations exist between the suprarenals and heart about the time there is any marked increase in cardiac activity.

At 144 hrs. in the chick, just at the time when the embryo shows evidence of responding to incident stimuli and the rapidity of the heart has increased considerably, the progress made in the differentiation and organization of the sympathetic system has reached an

advanced stage. Permanent ganglia, lying very close to the spinal nerves, are seen, while rami communicantes are plainly visible. It does not concern us now about the fate of the primary sympathetic chain, nor shall we consider the other equally interesting question regarding the inclusion of these ganglia in the vertebral canal, a definitive location, which Rau and Johnson think may be evidence of an interesting adaptive modification to protect these highly important centers from injury.

The details I have given of the development of structures in and around the adrenals doubtless have a very important bearing upon the incidence of function in these organs. We can trace a good many of the links between the sympathetic nervous system and the secreting system of the suprarenals. The possibility exists that in the embryos of the higher vertebrates the adrenals may function before the sympathetic innervation is completed,⁷ but I am not prepared to say that this is the case in the chick. The possibility of early functioning has been suggested by Lutz and Case, for the reason that as in the lowest vertebrates, the functions of the sympathetic nervous system have been taken over by a chromaffin system, there is some basis for believing very early functional activity is possible. It does not seem improbable that the medullary cells of the adrenals of the chick contain a hormone so there may be functional activity even before the eighth day of incubation. If this is the case, it explains the increased functional efficiency of nervous and muscular systems, and the prompter, more incisive character of the reactions taking place about this time. From 120 hours onwards there is a fairly rapid rise in functional efficiency of both nervous and muscular systems.

It is not necessary to go any further into details to emphasize the complexity and extent of the arrangements existing in the body of the embryo to facilitate more effective and extensive adaptations. The reflex arcs are practically completed—the only link in the chain that is lacking is the receptor in the periphery. All the preparations have been made within the house to prepare for the occupant, but no external sign has been displayed saying the domicile is actually ready for occupancy. The door is opened for the public just as soon as the peripheral links in the chain are completed. Differentiated receptors are the last elements to come into action.

Now I wish to discuss briefly certain special points about the reactions, and call attention to possible biological values of these

⁷ Lutz, B. R., and Case, N. A. Beginning of Adrenal Function in Embryo Chick. *Am. J. Physiol.*, Vol. 73, 1925, pp. 670-678.

primitive responses. The first reaction of the embryo to the prick of a needle is away from the source of irritation. This "avoiding" reaction seems to be common to all embryos and is the first pronounced overt movement to follow external stimulation. Years ago Wintrebert called attention to these early avoiding reactions, and I was able to confirm his observations for scyllium, pristiurus, and lacerta embryos, and later for the chick.

Any question about the object or purpose served by these first movements of the embryo brings up many interesting problems. Particular attention has been given to the analysis of the primary movements of amblystoma larvae by Coghill.⁸ In these studies he has described several stages through which the embryo passes from the time before pronounced movements are noticeable until early swimming movements are present. In the first period, a non-motile stage, embryos respond by means of muscular contractions to induced electric shocks or to comparatively violent mechanical stimuli such as stabs with a needle. Evidences of response are also present when the embryo is allowed to fall a distance of several centimeters and strike the water. The first movements to be noticed in the early flexure stage are not more pronounced than those of the non-motile stage but they are interesting in this respect that they follow the touch of a hair. These responses begin in the rostral myotomes and progress caudad and at any instant are observed to occur only on one side. This last observation corresponds with what we observed in the first responses of Pristiurus and Scyllium. The examination of the various mechanisms existing at this early stage Coghill believes give a satisfactory explanation of the reason why the predominance of movements is away from the side that is touched. The sensory mechanism at this time consists of the Rohon-Beard cells of the spinal cord, together with the general cutaneous component of the fifth cranial nerve, plus the pre- and post-auditory lateral line components. These large cells are sensory both to skin and to muscle and form the ascending sensory path. They have synaptic relations with the floor plate cells which are also connected with the motor neurons of the opposite side of the body. Neurons of the second order are interposed between the floor plate cells and the cranial sensory neurons of the first order. I can endorse all that Coghill has said in regard to the establishment of mechanisms for conduction to muscles existing at a period prior to the incidence of responses

⁸ Coghill. Correlated Anatomical and Physiological Studies of the Growth of the Nervous System in Amphibia. III. The Floor Plate of Amblystoma. Jour. Comp. Neurol., Vol. XXXVII, 1924, p. 40.

following tactile stimulation. Probably the same general arrangements are present in the chick, guinea pig and rat. The groups of cells in the floor-plate do not begin to function until the connections exist for conducting impulses across the nervous system to the contralateral side of the cord. The afferent and efferent systems are ready to begin action before movements directly follow external stimulation. The first movements described as the result of stimuli transmitted from the receptor fields are transferred to fibers of the motor tract of the same side, and then pass to those of the opposite side of the cord. In this manner as we have pointed out, a response that for practical purposes may be called a defense reaction away from the point of stimulation, follows. The embryo at this stage is equipped to react in only one manner to external stimuli; and that is away from the source of irritation.

The early reactions are the first pronounced indications of the motor sets of the embryos which, when they are opposed by other motor sets, express the organism's functional attitude or relationship to the environment.⁹ Usually we do not recognize the degree of integration involved in the production of definite postural attitudes. From the beginning of life the embryo maintains a pronounced "set" towards its environment. What Holt has said about "tonus" and "set" in the adult that they "are as much behavior as the more extensive play of the limb," also applies to the embryo. A careful analysis of the prenatal postural attitudes and early movements is a preliminary step in studying the behavior of the adult. One reason that the gap between body and mind seems to be very great is our inability to analyze the various processes concerned in the integration of postural and tonic attitudes that condition not only the higher range of intellectual responses, but shape the entire organization of activities concerned in living. We can at least make a beginning in the study of postural attitudes by carefully analyzing the behavior of the embryo.

It is quite a jump in time, as we measure the life of an embryo, from the period we have considered, marked by the first pulsations of the heart to the first pronounced movements of the body,—a period of 114 hours. In the chick embryo, age 144 hours, definite responses not only to external stimulation are noted but there is evident reinforcement of the muscular tonus. The movements, slow outward swings of the body extending down to the tail, are clearly visible. These increase slightly in extent if the temperature of the

⁹ Holt, E. B. *The Freudian Wish*. Henry Holt & Co., 1915, p. 108.

bath in which the embryo is immersed is raised, and decrease if the temperature drops.

At this stage, 144 hours, if adrenaline and chloretone solutions are painted over the embryo the heart-beats are accelerated while contractions of blood vessels are noted.

If the embryo is stimulated by an electrode at the nape of the neck, slow movements similar to those already described take place. The slowness of the responses suggests that these reactions are myotonic in character, and not the result of impulses conducted by the nervous system. Of course it is not possible to say definitely that the nervous system plays no rôle in the conduction of these particular impulses, but on the other hand there is nothing to suggest that even yet the nerves are the conducting paths for stimuli.

In spite of the elaborate preparations, the force and extent of the primitive responses develop relatively slowly. As late as 185 hours, pricking the embryo with a needle produces only a very slight reaction, and the general sensitiveness to external stimulation does not seem to have been greatly raised. To some extent, however, the general character of the movements has changed. The response to stimulation is prompter, and the movements themselves snappier than in the earlier stages. There is also a dorsal flexion of the leg when the embryo is irritated and a very slight raising of the wing. At the same time in view of the extensive structural preparations that have been steadily going on in the body, there seems to be a decided limitation of function. At 185–190 hours, as soon as the egg is opened and the embryo is disturbed by changes in temperature or in handling, very pronounced automatic movements appear. Among these movements can be noticed a tendency to draw up the legs and a slight lateral movement of the head. If the embryo is allowed to come to rest, and then it is stimulated at the nape of the neck by an induced current, the legs are extended, the wings raised, and there is a dorsal flexion of the trunk. No response follows the use of the direct current.

If these movements, which of course are not very extensive, are carefully studied, although they give the impression of some degree of coördination, they do not convey the impression of serving any immediate purpose, unless it be the important one of relieving tension by the discharge of energy.

The improvements noted in the ability to coördinate and associate new groups of movements is very apparent as growth progresses. One group of reactions particularly well worth studying occurs in the chick, as well as in the rat and guinea pig embryos. As has

already been noted, at 185 hours, the movements of trunk, wing, or forelegs show signs of some degree of coördination. The reactions involved in the flexion of the trunk and raising of wings or forelegs and legs are also evidences of considerable synergic potential. These integrated movements are evidently part of a whole series of movements, the first links in the chain, of what later serve as part of an important instinctive reaction, enabling the animal to fly or run away from a point of danger.

In the guinea pig "the avoiding reactions" are readily brought out by electrical stimulation. In 23 mn. embryos, by applying an electrode to the neck and using an induced current, we notice movements similar to those of the chick—dorsal flexion of back, tail, extension of legs, with evident contraction of some of the intercostal muscles. There are no evidences of response from ocular muscles at this time although there are very slight, but definite contractions of the muscles of the snout. Although the legs are extended as the result of stimulation, there is no sign of flexion taking place. In the case of the guinea pig extension is apparently developed before flexion of either fore or hind legs is possible.

In all these primitive reactions we have to consider the question of the presence or absence of sufficient tonus to permit the muscle to contract, and this brings up the problem of the processes responsible for the production of tonus. In the embryo at the time the heart begins to beat not only are the contractions themselves not dependent upon the presence of differentiated nerve elements, but the tone of the cardiac walls is not the product of neural control. As the contractions of the heart at this time are both slow and feeble, evidently a marked degree of tonus does not exist. Increase in tonicity however is not to be attributed merely to the development of the nervous system. The nervous system coördinates all the different functions of the body that in any way tend to strengthen, prolong and increase the rapidity of contractions. Undoubtedly the circulatory and endocrine as well as the nervous systems play a very important rôle in establishing the tone of all the muscles, both voluntary and involuntary. Probably neither the contractile nor plastic tonus represent entirely specific functions of the nervous system but depend primarily upon qualities of protoplasm. In the course of development the properties come under the control respectively of the cerebrospinal and autonomic systems.¹⁰ The machinery responsible for the increased tonicity of the muscles as we all

¹⁰ Langelaan, J. W. *Encéphale*. Jg. No. 20, Nrg. S. 629-644, 1925

know is exceedingly complicated, and includes a great variety of processes. Tone, as we observe the condition in the adult, is a very complex phenomenon to analyze and its presence or absence cannot be attributed to the functional efficiency or defects of one set of organs. "Tone," as Cobb¹¹ has so clearly stated in an interesting review of the evidence, "is a beautifully graded series of reactions continuously and unconsciously playing its part in every motor act." Although it is true that the nervous system in the adult is essential for the maintenance and reinforcement of tonus, from the study of conditions existing in the embryo it is evident that various other factors connected with the growth of the organism are of equal importance.

Within a relatively limited space I shall not attempt to discuss the mechanisms concerned in the delay, inhibition or reinforcement of impulses. It would not be possible to give even a brief summary of the various forces to be considered in connection with the modification of impulses taking place even during the early stages of the embryo's life. My object in mentioning the subject has been to call attention merely to the necessity for accustoming ourselves to think of reactions that seem to be such localized and simple affairs as the initial movements of the heart or limbs, as biological phenomena that call into operation practically the entire biological equipment of the organism.

No doubt there are certain aspects of these reactions which for all practical purposes, can be regarded as evidences of localized processes. These localized processes however have very specific relations to other processes involved in maintaining the balance necessary for living. We may for example pick out evidences of discriminative activity in many forms of response, and rightly assign the causes for these discriminative relations to special tissues or organs. It is permissible to speak of functional antagonisms called into operation following the stimulation of the suprarenal cortex and anterior pituitary on one side, with those responses controlled by the suprarenal medulla, posterior pituitary, or thyroid. Up to a certain point there is a well marked degree of antagonism, as well as of localization present, but at the same time all the processes are intimately related, and their effectiveness indicates the amount of vital energy available to maintain life. We should try to remember the supplementary as well as the antagonistic character of all adjustments.

The value of a biological, as contrasted with a physiological or

¹¹ Cobb, Stanley. Review on Tonus of Skeletal Muscle. *Physiol. Rev.*, Vol. V, No. 4, October, 1925, p. 547.

neurological point of view, is strikingly emphasized when we notice the extent and variety of all the structural arrangements involved in preparing for even a very simple nervous reaction—such for example as any of the initial responses to external stimulation. Photo. No. 6. I have already touched on this same point in mentioning the behavior of a number of embryos of different species of animals.

Recently the relation of the various endocrine organs to the incidence of functions in the nervous system in human embryos has been the subject of a very interesting paper by Hammar.¹²

The following table prepared by Hammar shows the stages at which the various glandular organs probably become active in the human foetus:

Hypophysis	Secretory cells appear at 22-27 mm. length	Glandular activity begins at 51 mm. length
Thyroid	27-28 mm.	27-28 mm.
Parathyroid	10-11 “	10-11 “ ?
Thymus	41-25 “	51-53 “
Suprarenal Cortex ..	15-16 “	17-18 “ ?
“ Medulla..	22-23 “	90 “
Pancreas	39-51 “	53-58 “
Testicle (interstitial).	27-28 “	27-35 “
Ovary.....	At end of embryonic life	

Hammar's opinion is that although the exact moment when the functional activity of the various endocrine organs begins to function cannot be definitely stated, it is possible to trace in a general way the correspondences between the cellular differentiation going on in the tissues and the correlative functional changes. Here again then we have an illustration of the importance of not overemphasizing certain functional changes as indicative of specific activity or special properties. The production of chemical substances as the result of endocrine activity is the result of the reinforcement and extension of a biological capacity possessed by tissues before these organs begin to secrete.

Résumé—Attention has been directed to the persistent tendency all living organisms have to establish, maintain and change their relations with their environment. Our knowledge of life has so far been restricted to a study of these relations which give evidences of regulation.

¹² Hammar, J. A. Univ. Upsala. A quelle époque de la vie foetale de l'homme apparaissent les premiers signes d'une activité endocrine? Upsala Lakareforenings Forhandlingar, Sept. 16, 1925, XXX, 375-480.

In the earlier stages of life the pressure of activity is expressed in forms of regulation that have to do with delaying, inhibiting or reinforcing impulses. The machinery required for these modifications in impulses exists before the neuroblasts and bundles of neurofibrils are differentiated. Considerable discriminative activity is present during the initial stages of life.

In response to increased needs for more extensive regulation the nervous system begins to develop. The first neuroblasts and neurofibrils appear in the acustico-facial area. At first the area of differentiation extends caudad as far as the vagus center and cerebrad to the region of the third nerve. Although it is probable that neurobiotactic impulses represent one set of factors in determining the differentiation and growth of nerve elements in the region it is highly probable that other and equally important elements connected with the growth of the embryo have to be considered.

The evidence of regulation is of course striking in the case of the initial movements in response to stimulation. The process of integration which is a part of the regulatory control is well illustrated in the first movements of the chick, and guinea pig embryos. In the former the wing, and in the latter the fore-legs are the first to respond to stimulation. It is possible to trace the steps in the process of integration of activities from the first simple movement of wing or fore-leg to the complicated movements that are evidently part of the preparations necessary to enable the animal after birth to retreat from a source of irritation.

The close study of the various steps in the integration of these movements shows it is merely an arbitrary decision when we consider the integration of movements has reached a stage sufficiently complicated to deserve the name of instinct.

Elaborate preparations are made in the muscular, nervous and endocrine systems before the embryo develops the capacity to respond except in very limited ways to external stimulation. Any considerable amount of reinforcement, inhibition, or prolongation of impulses requires the kind and extent of regulation imposed, not only by the nervous system but also by the circulatory, and endocrine organs. The increase in the muscular tonus, both plastic as well as contractile, is intimately related to a variety of changes taking place in different tissues, and not merely upon the functions of the nervous or muscular systems.

A careful analysis of the behavior of the embryo is greatly needed in order to prepare the way for our approach to the study of the life of the adult. We cannot make much progress in elucidating the

purpose and use of postnatal reactions until we have more accurate information of prenatal adjustments. An important field of investigation lies before us in regard to the order and extent of integration necessary to produce the different postural attitudes essential for the foetus to maintain its various contacts with a restricted environment. When at last we have succeeded in gathering the data required to explain the manner in which the activities during foetal life are regulated then we shall be in a position to proceed to answer some of the questions about the kind of regulations involved in the higher forms of adjustment; even those described as "temperament" and "character."

SOME FACTORS WHICH DETERMINE A SCHIZOPHRENIC¹ (DEMENTIA PRAECOX) REACTION
IN MALES: A CONTRIBUTION TO THE
STUDY OF HUMAN BEHAVIOR *

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Any discussion or consideration of schizophrenia must always give due emphasis to certain constitutional and environmental factors. "In the psyche of man one can theoretically differentiate what is given through anlage from that which is acquired in the course of life's destinies. Everything that man does or experiences leaves behind its trace (engram) and slowly alters the psychic constitution. Through self-training and bringing-up, divers experiences and the vicissitudes of life, persons of similar anlage (genotype) at birth may come into very different channels; and, when once a line of development has set in, return is impossible. Herein lies the personal responsibility of each and every experience. The capability for altering a given anlage, through circumstances, is quite varied in different individuals. Like immutable cliffs, many natures forge ahead as if they could withstand every storm, while others, on the

¹ Schizophrenia, a term devised by Bleuler, refers to one of the most important characteristics of this reaction, to wit, a splitting of the various psychic functions. Thus we observe a splitting of the ego into its components; a regression to primitive or archaic forms of thought processes where certain thoughts and feelings, which in the normal waking state would have been expressed by an abstract sentence, are expressed in the form of sensory pictures, symbols, postures, pantomime, etc.; normal components of the sphere of expression are disconnected and split off from their normal intrapsychic relationship, exaggerated, and for defensive purposes manifest themselves in bold relief. "With the name, dementia praecox or schizophrenia, we designate a group of psychoses whose course is now chronic, now in thrusts; and which may halt at any stage, or may recede, but probably does not allow a complete *restitutio ad integrum*. Schizophrenia is characterized by a specific alteration of thought, feeling, and relationship to the external world. . . . The basic symptoms are formed by the schizophrenic disturbances of the associations and the affectivity; through an inclination to place their own phantasy over reality, and to shut themselves off from the latter (reality), *i.e.*, autismus. To this one can add the absence of symptoms which play a dominant rôle in certain other psychoses, *e.g.*, primary disturbances of perception, orientation, memory, etc." (Bleuler: *Dementia Praecox oder Gruppe Der Schizophrenien*, pp. 6 and 10. verlag v. Franz Deuticke, Leipzig u. Wien, 1911.)

* Read before the New York Psychoanalytic Society, Feb. 23, 1926.

contrary, devoid of all firmness, appear to be nothing more than the echo of their casual environment." (1) And, in like manner, schizophrenia may also be placed into that large category of human types of reaction; it represents an effective, though socially faulty, adjustment of the genotype to certain highly emotional experiences in childhood. The schizophrenic like his twin brother, the homosexual, is not a disease product, but a psychological adjustment product.² The constitutional factors, those which are inherited, include the physical status (size, stature, body, contour, shape of the face—which are of clinical importance) as well as the temperament of an individual, *i.e.*, his mode of action, reaction, and feeling. I quite agree with White that: "One must consider the organism as a whole. The psyche is as old as the soma; and for each situation there is as well a psychic as a somatic component." (2)

For many years schizophrenia and the manic-depressive psychoses, from a study of their pre-psychotic personality or temperamental make-up, have directed the attention of psychiatrists to two large main groups of temperamental types: the schizothymes and the cyclothymes. But only within recent years, mainly through the work of Hoffman (3) and Kretschmer (4) in Germany, has this important matter received special attention which was aimed at a more detailed description of the two main temperaments and their inheritance from parents to offspring as well as a correlation of them with certain coexisting morphological phenomena. In this country Hoch, Meyer, Kirby and others have always stressed the importance of personality make-up and its relation to the psychoses. And furthermore, careful work is still being done in correlating certain alloys of these two main groups of temperament with mixed psychotic reactions, *e.g.*, the intermediate psychoses (Hoffman), the "schizoid manic-depressive" cases. It has been observed that the pre-psychotic and psychotic personality of schizophrenics and manic-depressives, whichever the case may be, represent caricatures of the normal schizothymic or cyclothymic temperament, and, with this, modern psychiatry no longer limits itself solely to the narrow, static confines of the asylum, with its rigid, near sighted classifications which, though often practical, really do violence to nature. Not only in the matter of constitution have we taken a broader vision, but also in the matter of psychotic productions (phantasies and

² The cell changes found in schizophrenia do not seem to be related, either as cause or effect, to the reaction known as dementia praecox; this is eminently borne out, on the psychological side, by the history and course of the reaction in all its phases. See Dunlap: "Dementia Praecox." Amer. Jour. of Psychiatry, Vol. III, p. 403, January, 1924.

delusions) which show an unmistakable relationship to the content of many dreams of the sane and the phantasies expressed in the noblest poems and dramatic works of famous men of letters.(5)

In this paper we will omit a discussion of the anthropometric side of the problem, because we do not consider it essential for an elucidation of the subject at hand, and therefore we will proceed with the question of temperamental make-up. We will first describe as briefly as possible some of the salient features of the schizothymic temperament; then something about the lower stages of sexual evolution to which the schizophrenic regresses; then the specific group of environmental factors occurring in childhood in reaction to which some persons with schizoid or schizothymic temperament may develop a schizophrenia, and finally some of the precipitating factors and their mechanism.

It is needless to say that during the course of an individual's life, with its numerous experiences and reaction thereto, the temperamental genotype becomes subject to a certain degree of change, often manifested as an exaggeration of some of its components, although, in general, the type of reaction characteristic of that temperament remains the same. Some schizothymes in reaction to a given situation will experience a magnification of certain traits characteristic of that temperament; this may be transient or more or less permanent depending on the situation, its degree, and its emotional significance to the individual. Others, however, will be born with an exaggeration of schizothymic traits where the schizothymic anlage is present, for example, in marked degree in the chromosomes of both parents; then it is often difficult to determine whether a given schizoid type (transitional type between the normal schizothyme and the schizophrene) is the result of anlage, a reaction to a severe emotional experience, or both. At all events, one of the reactions of a schizothyme or a schizoid to certain emotionally important environmental stimuli experienced in childhood is the schizophrenic or dementia praecox reaction, which usually occurs many years after the initial situation was experienced, especially around puberty when the sexual impulses become more urgent. Whether a schizothymic or schizoid individual later develops a psychosis essentially depends not only on the nature and degree of the constitutional anlage (both temperamental and intellectual), but also on the nature and degree of the environmental factors of emotional significance to the individual in his childhood, his adaptive qualities, *e.g.*, sublimative

capabilities,³ presence of a hypertrophic conscience, etc., and some precipitating cause (related to certain repressed material in the unconscious) which later presents itself.

"In contrast to the simple, uncomplicated cyclothymic natures with their direct, natural, transparent, and undisguised manner of feeling, which can be correctly estimated by everyone, the schizothymes have something problematical about them" (Hoffman). One may live with them for many years and still not know them. They stand before us like living question marks. Their psychaesthetic proportion and mood lies between the poles: hypersensitive-ness and coldness of feeling—a mimosa-like,⁴ timid sensitivity and habitually sudden anger on the one side, dullness and diminished spontaneity on the other. The key to the schizothymic temperament, however, must be recognized by the fact that most of them are neither hypersensitive nor cold, but hypersensitive and cold at the same moment, and this in most varied combinations. Their psychic tempo possesses a jerky temperamental curve: between unstable and tenacious alternative modes of thought and feeling. Their psychomotility is often inadequate to the stimulus, being restrained, lamed, inhibited, stiff, etc. (Kretschmer). Bleuler tells us that in schizophrenics with profound emotional deterioration, residuals of vulnerable, hypersensitive complexes, which are still present, can be demonstrated; and when touched, discharge sudden extraordinary affective manifestations.

The affectivity of schizothymes is mostly abrupt and indented, incalculable and boundless; it stands in sharp contrast to the full, rounded-off, nicely modulated affective curve of the cyclothymic. The habitual emotional reactions of most schizothymes, when contrasted with those of the cyclothymic, in mild degree, already manifest a stiff, constrained quality about them. Ideas of emotional significance exert their influence under the surface in a tense, cramp-like attitude and often later abreact themselves, on the slightest provocation, with astounding outbursts of emotion. Unlike the cyclothymic, who becomes hot-headed and says or does what he wants to at the moment of an insult, the schizothymic has a tendency to swallow it and to let it boil within him until something comes along which

³ In our state hospital schizophrenics, as a general rule, we find great poverty of sublimative ability; they lack the marvelous sublimative and creative qualities of the poet and dramatist, and the socially adjustive faculties of their twin brother, the homosexual.

⁴ Compared with the mimosa pudica whose leaflets close while its leaf stalks droop when the plant is jarred or touched.

irritates him beyond reason and then the pent-up irritation and tension is gotten rid of through a severe, abrupt, emotional explosion. When once an impulse is vetoed, schizothymics possess a talent for repression. They tend to lack ability for conciliatory moderation and well meaning emotional compromise; under certain conditions, this tends to make them fanatics. For them a thing is either *Yes* or *No*; and this characterizes their mental attitude toward their impulses. They have a tendency to be either drawn toward a person or see in him their worst enemy—either an angel or a devil, no compromise, no intermediates. Where there exist sexual impulses of a perverse nature, which in schizophrenics lie parallel to a hypertrophic conscience, this unconciliatory mental attitude will cause severe psychic conflict, even to the point of mentally trying to excrete or project them. They possess, in pure culture, a capability for bringing into action a normal, reflexive component of the sphere of expression commonly known as “freezing,” a transient, slight introversion and lifting up of transference toward one or more persons. When in an environment which is emotionally offensive to their hypersensitive nature, clam-like, they have a tendency to contract within themselves; to develop a transient attitude of “aloof-indifference”; to partially draw in their libido, like the amoeba draws in its pseudopodia when irritated externally—only to thaw out emotionally, once more, when the unfavorable stimulus subsides. The so-called stiff or rigid affect (Bleuler) of the schizophrenic, I believe, is not causatively due to an organic neurological disease or an endocrinopathy any more so than a hysterical conversion symptom or a depression following the loss of a loved one, but is merely an exaggeration and a prolongation of this normal “freezing or introversion reflex” because of the irritation and psychic pain constantly produced by certain stimuli and situations in the environment (homosexual and incestuous stimuli) that have acquired emotional significance by virtue of the particular type of repressed sexual impulses which these unfortunate individuals happen to possess; this has a tendency to produce a chronic state of “aloof-indifference.” The stiff affect, because in varying degree it abolishes a transference, automatically acts as a checkmate, a safety valve, or defense mechanism against the possibility of gratifying, in reality, their perverse sexual impulses which are incompatible with their ideals, ethical sense, ego-ideal, or the demands of society which these individuals fear. It is my belief that this stiff affect of the schizophrenic arises from a voluntary reinforcement of a normal

"introversion reflex" after the manner described by Kretschmer⁵ for shaking tremors in hysteria. It is this mechanism (the introversion reflex), occurring neurophysiologically, I believe, through the striopallidal system that brings on, when voluntarily reinforced, an introversion of libido in schizophrenia as was first described by the Freudian school and the psychological sequelae of which they have so admirably delineated. When most of the libido is suddenly

⁵ Kretschmer: Hysteria. For details see his chapter IV on "The Laws of Voluntary Reinforcement of a Reflex," Monograph 44, published by the Nervous and Mental Disease Publishing Co., Washington, D. C., 1926. While during the psychosis schizophrenics, as a rule, are unconscious of their perverse impulses or at least disown them, at some time in their early life they were conscious of them and were confronted with the problem of adjusting to them in some way. These impulses were first of an incestuous nature and were adjusted to, in our cases with stiff affect, by means of the "introversion reflex" so that they became relatively anesthetic to incestuous stimuli. In other cases we find an identification with the mother and the impulse seeks gratification homosexually. For other types of individuals there may be other forms of adjustment. In many of our cases we obtain a history of early homosexual gratification with one or two episodes, perhaps, but sooner or later this outlet becomes blocked, and the patient refuses to have insight into his homosexual impulses; they are not compatible with his ideals. Then the "introversion reflex" may again come into effect as a defense reaction. And so, in varying degree, depending on the force of the blocked libido or the nature of certain environmental factors having significance to the blocked impulses, the patient becomes relatively anesthetic to incestuous and homosexual stimuli in the environment. In erecting a barrier against the incestuous tendency, by experience, we find that the patient in varying degree becomes indifferent to heterosexual stimuli because to his unconscious mind every woman becomes associated with the mother. Hence the majority of schizophrenics give a history of always having been indifferent to women, impotent heterosexually, and only show a tender attachment to the mother, sister, or their imagines. In the case of homosexual outlet, homosexual stimuli sooner or later, because of the conscience, become painful and irritating to the patient; this calls forth the "introversion reflex" whenever he comes in contact with a male in his environment who appeals to him erotically; soon, as the homosexual impulses increase, this begins to include a greater and greater number of men and the patient becomes a recluse, and the whole mechanism acts automatically and with greater objectivity depending on the individual case. When something in the environment comes along which offers gratification to the repressed impulses a temporary disturbance of this emotional equilibrium occurs and in our cases is met with an increased effectiveness of the "introversion reflex" which on reaching a certain degree causes a complete introversion of libido that may be compared to a total eclipse of the sun by the moon where the sun's rays represent libido. Kretschmer tells us that "a reflex under subthreshold stimulation can be brought into activity by the addition of a volitional impulse of a very definite kind, or, an automatically active reflex can be maintained and strengthened through such an impulse." The energy which maintains the "introversion reflex" is the libido and when it is abreacted by hatred, sublimations, systems of delusions, etc., the necessity for the "introversion reflex" becomes diminished, and the affect not so stiff; this accounts for variations of affective stiffness in the individual case. The subthreshold "introversion reflex" is reinforced by the repressive forces of the will, the ego impulses; and finally becomes impressed upon the mind, automatic and objectified. In the latent schizophrenic, the "introversion reflex" probably never goes below threshold because of constant exposure to homosexual stimuli; in the normal schizothymic it only appears transiently in mild degree as a reaction to irritating stimuli in the environment.

directed to the ego impulses, aimed in our cases at moral self-preservation, a voluntary reinforcement of the "introversion reflex" may occur to such a degree that a catatonic stupor is developed. Every psychiatrist knows how difficult it is to gain emotional rapport with most schizophrenics, *i.e.*, to make a transference. But it is this very lack of transference, manifested physically as stiff or rigid affect, which becomes automatic and objectified (perhaps even inherited to future generations, like a reflex) and serves to protect such individuals from the outcome of a strong transference. We seldom like persons because of their intellectual attainments only, but more because of the way they make us feel. If one wishes to see the other side of the picture, to appreciate how helpless even a brilliant man may become in the presence of unchecked emotions or uncurbed transference, coupled with strong social tendencies, one need only read Oscar Wilde's "Epistola in Carcere et Vinculis"; and also his *Life and Confessions* by Frank Harris—especially where Harris says: "As a rule the epicene have soft voices and ingratiating manners, and are bold enough to make a direct appeal to the heart and emotions; they are considered the very cream of London society." My reason for believing that the introversion reflex is brought about neurophysiologically through the strio-pallidal system⁶ is because lesions in that system often produce symptoms which resemble emotional phenomena commonly observed in the schizophrenias.

Kretschmer tells us that schizothymes are either absolutely unsociable or only eclectically sociable in small, exclusive circles (the aristocratic types); they tend to be superficially sociable without

⁶ Schilder in his "Medizinische Psychologie" on page 56 says: "To be sure, in a general discussion of localization, one must not fail to point out that the psychic function of directing an impulse can also become disturbed by circumscribed brain lesions. Such disturbances of impulse are met with in frontal lesions, but especially in lesions of the strio-pallidal system. These disturbances are two-fold in nature; there may be present an affluence as well as a poverty of impulse and therewith also an excess or deficiency in the effectiveness of impulse distribution (*Zuwendung*). There (in the strio-pallidal system and the frontal region of the cerebrum) is located only one of the restrictions of an impulse whence it is guided and distributed. These areas are necessary in order that the impulse can adhere to and become effective toward certain experiences. The act as such is not localized." And on page 77, Schilder says: "In diseases of the strio-pallidal system we meet with disturbances of impulse. Such patients show a reduction of the impulses toward the environment. While a healthy person, sitting in a chair unemployed, glances now here, now there, and finally gets up as a result of some idea, perhaps, then comfortably reseats himself; patients of this type sit there stiff and immobile, they do not glance toward moving objects which emerge in the lateral field of vision. Nevertheless, they grasp quite well, and sensibly answer questions which are put to them."

deep psychic contact with their environment.⁷ To the casual observer, they seem to hold a pane of glass before them, so far and no further. It is this constitutionally unsociable tendency, I feel, that predisposes schizothymics, in a measure, to strong family attachments which may become incestuous; these incestuous tendencies, in the case of males, are unwittingly fostered by the mother. In at least 90 per cent of male schizophrenias, the patient is his mother's favorite child. If the mother has strong narcissistic tendencies or does not receive satisfactory emotional gratification from her husband, the young son easily becomes the recipient of her feelings.⁽⁶⁾ In some of my cases, this mother-son situation, even to the layman, assumes at times the appearance of a courtship.

A careful study of the sexual⁸ impulse or libido and its various forms of expression has shown beyond a doubt that it passes through certain preliminary stages before it attains the adult, normal, heterosexual level. These preliminary stages of sexual expression are known as the pregenital stages of the libido, because the genitals do not play the dominant rôle which they have in normal adult object-love; they are the forerunners of normal sexuality. There are two pregenital organizations: (1) the oral phase, (2) the anal-sadistic phase. An area of the body which, on stimulation, gives rise to erotic sensations is known as an erotogenic zone. The erotogenic zones associated with the first and second phases of pregenital organization are the mouth and rectal areas. The oral erotic stage is particularly well shown in the sucking of infants. "The ardor with which the infant presses both hands into his mouth, the vehement snapping at its own fingers, the complete devotion to the rhythmical sucking, and the final gratifying effect of the whole process makes one recognize what power dwells in these early impulses. This power manifests itself with especial distinctness in that many persons still remain subject to it in adult life. . . . The facts of normal eroticism plainly show that the mouth in no way gives up its significance as an erotogenic zone. And then a study of sexual perversions allows us to recognize that the mouth can take over the complete significance of a sexual organ, *i.e.*, a genital rôle. And furthermore, a psychoanalytic study of the neuroses shows that frequently the mouth, only in consciousness, has lost its significance as an erotogenic zone, that, on the contrary, it continues in the uncon-

⁷ To my mind, this is a bit exaggerated; there is, however, that tendency.

⁸ The word sexual is always used in the broad sense of Freud and does not necessarily refer to the genital form of expression. We use it to designate any pleasure derived from any form of sensory stimulation utilizable for creative capacity.

scious through those substitute formations which are known to us as neurotic symptoms. To psychoanalysis we can give thanks for the knowledge that these manifestations attain the value of infantilisms; they can be partly explained as a persistence of infantile impulses in the unconscious, partly as the expression of a subsequent regression to stages of the libido already overcome. That such repressed infantilisms can be made unrecognizable through manifold transformations (*e.g.*, see Case VII), and may be reversed into just the opposite was mentioned by Freud in 1905 in connection with manifestations which center around the oral zone. Neurotics whose oral zone was originally distinguished by a special erotogenicity which manifested itself, perhaps, by long continued sucking, in later years are often subject to nervous vomiting" (7). (See Case XIV, where vomiting occurs because of repressed oral erotic cravings.) The delineation of oral eroticism has taken considerable space, but the reader will appreciate its significance in relation to schizophrenia later on when the cases are presented. Manifestations of anal eroticism are also seen in schizophrenia, but in my experience by no means so frequently as the oral, and hence we will leave the matter.

We can also differentiate three stages of libidinal investment: the autoerotic where there is no love object (especially well observed in the hebephrenic type of schizophrenia); a narcissistic stage where a person is his own love object; and a stage with a love object, represented by some form of erotic relationship between two or more individuals. These stages of libidinal investment pass from one to the other through insensible gradations. One may observe oral, anal, or both, erotic manifestations at all three stages of libidinal investment. As a result of regression the libido seeks its outlet in lower types of libidinal investment with corresponding pregenital erotogenic zones. In the hebephrenic type of schizophrenia where the libido investment is autoerotic, oral eroticism is manifested by holding of saliva, gourmandizing (at this stage the sexual and nutritive impulses are associated), eating of rags and mattress stuffing, etc.; and anal eroticism by prolonged holding of rectal contents or anal masturbation; genital eroticism by almost constant masturbation; the incontinence of urine is also an autoerotic manifestation (see the urolagnistic perversions). In the paranoid types of schizophrenia, where the regression is not so profound as in the hebephrenic type, the libido investment is narcissistic (expressed by ideas of magic,⁽⁸⁾ grandeur, and omnipotence; exhibitionism, ideas of great physical beauty and purity, etc.) and the oral eroticism is

characterized by strong impulses to perform fellatio,⁹ ideas that the food contains semen, ideas that persons call them a "c.s." "muff-diver," etc. At this stage there is a tendency to incorporate the homosexual love object in the form of semen. In the paranoid types, anal eroticism is manifested by collecting and secreting rubbish about the individual's person, complaints of constipation (easily recognized as psychopathological because of their great exaggeration; such patients will say that they have not had a bowel movement in months, and beg for any amount of cathartics); the sadism becomes converted into masochistic delusions in the form of: ideas of being chopped up, killed, beaten up, etc., and often the patient will admit that he has impulses to choke or kill people but controls them. When for some reason, then, the libido becomes inhibited or blocked in its object investment, it dams back and causes regression to narcissism or autoeroticism and to pregenital manifestations of the libido (in our cases this is usually symptomatic). If a person in childhood had acquired undue erotic pleasure at these pregenital levels, sometimes through the faulty training of parents, he has difficulty in progressing to the higher level, *i.e.*, he becomes fixed at these levels through bad habits, aided, perhaps, by a constitutional disposition in that direction in some cases; he may become a pervert or a neurotic depending on whether he gratifies his sexual impulses in reality or phantasy. In schizophrenia, therefore, the libido becomes introverted neurophysiologically by a voluntarily reinforced "introversion reflex" which becomes objectified and automatic, and the libido is abreacted through a regression to narcissism (in the paranoid type) or to autoeroticism (in the hebephrenic type) with oral or anal erotic manifestations depending on the erotogenic zone to which the patient had become fixed.

After passing through the pregenital stages of sexual evolution, the libidinal energies of the child gradually become invested on some love object, *i.e.*, there is a development of object love; this is encouraged by the tender care of the parents and by the mother in particular. The parents are the first love objects placed at the disposal of the child. In the male there is a tendency to prefer the mother to the father. In strongly schizothymic children, with their constitutionally tenacious and constant tendencies which are the antithesis of the fickleness of the cyclothymic, this attachment to the mother is not easily relinquished, and is encouraged unwittingly by some

⁹ The approximation of mouth and penis.

mothers. Mothers of that type always wish to have their sons devoted to them above anyone else; really would like to keep the boy a baby; will sometimes bathe or allow him to share her bed (I know of at least three cases where such bad hygiene accounted for strong incestuous tendencies in the patient) even after he has reached puberty. It is here that much can be done in the prophylaxis of schizophrenia. Although, for a time, a tender attachment exists toward both parents without conflict, the male child, however, soon begins to realize that in many ways his father is a hindrance to his relationship with mother. He learns that, when father is away, he has more of mother's attention. And so there arises a certain degree of jealousy and antagonism toward the father and a desire for his absence. Alongside of these antagonistic feelings, there also exists a feeling of love for him, *i.e.*, the male child has an ambivalent attitude toward his father. As the erotic side of the relationship between mother and son becomes stronger, the opposition toward the father tends to become greater and the psychic conflict becomes more acute; the oedipus complex then comes into existence, *i.e.*, the child wishes to possess his mother all alone and would like to have his father out of the field of competition. My personal feeling, however, is that the oedipus complex, at least in degree, is not such a universal phenomenon as some members of the psychoanalytic school would have us believe. That it exists in the history of schizophrenics can without effort be recognized by any careful, unprejudiced observer. Whatever oedipus complex factors remain in the relatively healthy individual certainly have never attained the degree and encouragement that they have in the life of a schizophrenic. The experience of the psychoanalytic school shows that the oedipus conflict is solved ideally by the boy identifying himself with his father, and, as he attains puberty, gradually transfers his libido from his mother to some female outside of the family circle, maintaining only a tender, neutral attitude of affection and gratitude toward his mother. In some individuals an incestuous attitude toward the mother (or woman who as mother substitute raises the child, a sister, or a mother imago) is maintained even into adult life, usually causing disturbances in the psychosexual sphere; it generally is more or less unconscious. Other incestuous individuals will give up the mother as a love object (perhaps not entirely in the unconscious mind) and will identify themselves with her and will assume a feminine mother attitude toward their own sex, *i.e.*, will become homosexuals who long to receive the male genital. In other cases, the individual seems to oscillate between an incestuous and a homosexual investment of

libido. In schizophrenics there is often present a strong hatred for the father, a desire for his death (usually, though not always, repressed and often directed in an attenuated, disguised form toward imagines: king, president, governor, doctor, etc., which accounts for assassinations of paranoiacs), an unconscious or vaguely conscious wish to castrate the father like Cronus did in Grecian mythology. These castration tendencies, which are often fulfilled in phantasy, cause a severe sense of guilt; and talionically, the patient consciously or unconsciously fears that he will be castrated, or actually, in some schizophrenics, tries to atone himself by self-castration or, through displacement, by other forms of self-punishment, *e.g.*, gouging out his eye-balls, believes that he is going blind—like Oedipus, cuts off a finger or arm, or may only make a slight cut in his finger and will be unable to give his motive for doing it, many patients prefer to cut their throat (a displacement from below to above) or kill themselves in some other manner—cutting the throat and hanging seem to be favorites among schizophrenics.

The incest barrier, described above, blocks satisfactory heterosexual outlet and causes an inflation of the homosexual component of the bisexual anlage; and in persons whose ideals or philosophy of life do not conflict with such gratification and who in addition often may have a large amount of female element in their constitutional make-up (most schizophrenics, by the way, are both mentally and physically very masculine), the sexual impulse takes that outlet as an adjustment against incestuous tendencies; they remain relatively comfortable as far as sex is concerned. In schizophrenics, however, the homosexual outlet is sooner or later blocked, like the incestuous, because of a hypertrophic conscience in the manner already described, *i.e.*, by repression and a voluntary reinforcement of the "introversion reflex"; they then become latent homosexuals who, when from inner or outer causes the repression weakens, may develop a schizophrenia with defense mechanisms against homosexual gratification in reality (stiff affect, delusions of persecution, ideas that strangers call them "c.s.," "fairy," "woman," "fag," "fruit," etc.). Inasmuch as the schizophrenic has finally blocked off all form of object love (both homosexual and heterosexual) in reality, the sexual impulse seeks gratification in phantasy (dreams, hallucinations, wish-fulfilling delusions, etc.) in accordance with the principle: "Pleasure without Blame"; and in a regression to lower forms of sexual outlet: oral and anal eroticism on a narcissistic or autoerotic level of libidinal investment. A patient of mine indignantly complains that someone is using a machine on him

which makes him have a vagina and at the same time he feels as though a penis were being pushed in and out; any attempt to bring insight into the delusion immediately makes the patient resentful; he really wishes to maintain it, putting the blame on someone else.

The matter of identification with the mother always seems to be a difficult psychological mechanism to grasp. Identification expresses a desire to be like someone else, to live through the emotions of someone else. It is a normal psychological mechanism by which we live through the experience of others. When a hospital interne likes an attending physician, he has a tendency to unconsciously acquire little mannerisms of his chief, wear the same kind of necktie, etc. This mechanism also explains the multiple personalities of certain hysterics who by the psychological mechanism of dissociation are able to assume first one personality then another. Freud says that identification is the original form of emotional tie with an object; that in a regressive way it becomes a substitute for a libidinal tie, as it were, by means of the introjection of the object into the ego. "The genesis of male homosexuality in a large class of cases is as follows: A young man has been unusually long and intensely fixed upon his mother in the sense of the *Œdipus* complex. But at last, after the end of his puberty, the time comes for exchanging his mother for some other sexual object.¹⁰ Things take a sudden turn; the young man does not abandon his mother, but identifies himself with her; he transforms himself into her, and now looks about for objects which can replace his ego for him, and on which he can bestow such love and care as he experienced from his mother. This is a frequent process, which can be confirmed as often as one likes, and which is naturally quite independent of any hypothesis that may be made as to the organic driving force and the motives of the sudden transformation. A striking thing about this identification is its ample scale; it remolds the ego in one of its important features—in its sexual character—upon the model of what has hitherto been the object. In this process the object itself is renounced—whether entirely or in the sense of being preserved only in the unconscious is a question outside the present discussion. Identification with an object that is renounced or lost as a substitute for it; introjection of this object into the ego, is indeed no longer a novelty to us. A process of the kind may sometimes be directly observed in small children." (9) The following are two mother identification dreams which were imparted to me by a male homosexual who always had extreme resistance to that form of

¹⁰ The mothers of latent schizophrenics often try to block any attempt of their son at a heterosexual adjustment.

sexual gratification. In his dreams he showed phantasies analogous to those commonly seen in schizophrenia.

Dream I: "With mother in a bungalow in the country. She took my face away and gave me a girl's face—blonde, blue eyes, curls, hat. I looked into the mirror and was amazed at this change. The various expressions of my face appeared on the face of this girl reflected in the mirror. I may have been in girl's clothing at the time, but am not sure about this. Later I looked into the mirror again and, with great surprise, saw that I had my own face back again. I was not wearing glasses then (he did not wear glasses until he was eleven or twelve years old). It seemed as if my mother wore my face while I had the girl's, whereas she put on the girl's face when I got mine back again."

Dream II: "I dreamt I was at some sort of party. Somebody spilled some sort of sticky syrup (semen) on my clothing. Apparently had previously spilled cigarette ashes (symbols for penis and semen) on the same spot. The mixture formed lye, which ate through the cloth at an amazing rate, making great holes in my coat and trousers. It became evident, much to my mortification, that I was wearing a pair of pink corsets, belonging to my mother; these showed through the holes in my trousers." (Compare with Case IV.)

I have mentioned identification with the mother in order that the reader will be in a better position to understand the impregnation phantasies commonly expressed in male schizophrenias by ideas of giving birth to a child, having a child in the abdomen, complaints of swelling and pain in the abdomen with vomiting and absence of physical signs, ideas of being transformed into a woman or that strangers call them a "woman."

That component of the psyche which ushers in a repression of the incestuous and homosexual impulses and which, in our cases, furnishes the volitional support of the reinforced "introversion reflex" is what Freud calls the ego-ideal. The child with its well marked primary or secondary narcissism soon discovers that his parents are not so satisfied with him as he is with himself; that they constantly criticize his primitive behavior, and through imperatives, prohibitions, and other ways seek to better it; they impress upon his mind a picture of himself as he ought to be if he wishes to be acceptable to them or to good society. By various identifications, he seeks to be like his parents and other laudable characters whom he hears about: Christ, President, King, Priest, etc. These earlier identifications become more or less fixed; but, as the individual goes into adult life, other identifications are constantly built over these primary ones and help to form certain traits of character. In regression to primary or secondary narcissism, these later identifications—forming (with the

imperatives and prohibitions of parents, teachers, religion, society in general) the ego-ideal—become lifted up and their place taken in certain types of schizophrenia by the earlier ones. The imperatives and prohibitions of parents, teachers, etc., become so strongly impressed upon the mind that they function automatically, forming what is known as the conscience, a superstructure of the ego, an intrapsychic miniature of the requirements of society, which under certain conditions (dreams, guilty conscience, auditory hallucinations of persecution, ideas of reference, and the self-accusatory ideas in melancholia) observes and flays the rest of the ego for its shortcomings; under certain conditions (melancholia) it recognizes impulses which the rest of the ego refuses to admit as existing in the individual. Regressively in schizophrenia, the conscience, which perceives impulses that the rest of the ego refuses to recognize, once more manifests itself in its original form as voices coming from the outside and which condemn, punish, and admonish the rest of the ego because of its unethical tendencies. Hence, in guilty conscience, we normally have a feeling that the outside world knows of our secret misdeeds and in male schizophrenics the feeling that strangers call them: “c. s.,” “degenerates,” “fairy,” etc., or accuse them of incest. The tension between the claims of conscience and the unethical tendencies of the ego is perceived as a feeling of guilt. In schizophrenics, the conscience appears to be hypertrophic and unyielding, probably on account of their constitutionally sensitive, uncompromising, unconciliatory, “yes or no” temperament and a powerful ego-ideal which is often manifested by ideas of untarnished moral purity.

It is quite true that there are many individuals who have the same incestuous and homosexual tendencies (conscious or unconscious) found in our schizophrenics and yet never develop a psychosis; they are persons, however, who have been able to adjust to their Oedipus situation in a manner which is to a varying degree compatible with reality and social life; they are individuals with ample admixture of the extroversive, cyclothymic traits of character, and not too delicate consciences; persons who, like many poets and dramatists (they seem to prefer incest material), have built up magnificent sublimations acquired with great effort and assiduous application to an all absorbing life's work which often gives them more satisfaction than their erotic life, even becomes a necessity for life. One is struck by the poor sublimative equipment possessed by most of our state hospital schizophrenics, either from lack of opportunity, energy to acquire it, or absence of inborn talent. I think that much could be done in a prophylactic way by encouraging the arts. How well this is appre-

ciated even by persons who are not officially psychiatrists, is attested to, for example, by the following highly significant words of Oscar Wilde (10):

"The worship of the senses has often, and with much justice been decried, men feeling a natural instinct of terror about passions and sensations that seem stronger than themselves, and that they are conscious of sharing with the less organized forms of existence. But it appeared to Dorian Gray that the true nature of the senses had never been understood, and that they had remained savage and animal merely because the world had sought to starve them into submission or to kill them by pain, instead of aiming at making them *elements of a new spirituality, of which a fine instinct for beauty was to be the dominant characteristic*. As he looked back upon man moving through history, he was haunted by a feeling of loss. So much had been surrendered, and to such little purpose. There had been mad wilful rejections, monstrous forms of self-torture and self-denial, whose origin was fear, and *whose result was a degradation from which, in their ignorance, they had sought to escape*. Nature, in her wonderful irony, driving out the anchorite to feed with the wild animals of the desert and giving to the hermit the beasts of the field as his companions." (This gives a hint as to the cause of the seclusive tendencies of the schizophrenic.)

After alluding to the schizothymic temperament and its characteristic type of reaction, to the schizophrenic form of adjustment to certain environmental factors in childhood which create adjustive attitudes that later cause aberrations in the psychosexual sphere with severe mental conflict from which results a regression to lower forms of sexual organization, we finally come to a presentation of some rather typical cases of schizophrenia in males where a flight into the psychosis took place when something in the environment occurred which partially broke down the repression because of its association with certain highly emotional complexes in the unconscious alluded to in the previous paragraphs. We will exclude, wherever possible, all description of hereditary elements and personal history, because in a general way these have already been outlined; we will limit ourselves to precipitating factors of psychological significance and their relationship to certain trends commonly found in male schizophrenics. On the other hand, however, we do not wish to create the impression that these psychological factors, although they are the most essential ones, are exclusive. Many contributory factors, in addition to the psychogenic ones, undoubtedly assist in precipitating the disorder, *e.g.*, the toxins—infections, alcohol, narcotics, etc., long hours of work, excessive and uninteresting work, head trauma, organic brain

diseases, etc., all of which have a tendency to reduce the efficacy of the function of repression which is a late acquired neurophysiological mechanism aimed to keep the individual in correct ethical alignment. These contributory factors may help to bring on a schizophrenic reaction long before it would have occurred without their assistance, *e.g.*, in the acute alcoholic hallucinosis.

Case I. W. D. Admitted to M. S. H.¹¹ May, 1924. Age seventeen years. Single. High school education. File clerk. The patient's family had considered him a normal child until he reached the age of thirteen and one-half years, when a change of disposition was noticed; he became very disagreeable and discontented. He never would associate to any extent with the opposite sex (a common symptom elicited in the majority of schizophrenics), could not get along with his fellow employees (due to lack of adequate transference), gave up his work, and remained idle. At the age of fifteen, he was admitted to Bellevue Hospital with a history that he had insisted on staying in bed for three weeks and was extremely abusive to his mother whom he treated with violence the day prior to his admission (ambivalent emotional attitude towards his mother; the hatred is here a defense against incest and also an outlet for his libido in a sadistic form). Previously he had been greatly attached to his mother. On admission to Bellevue he was very irritable. When questioned by his mother, he became very excited and tried to strike her. He said that he hated her; but did not know why. He improved and was discharged after four days residence in the hospital. Following this he occasionally did a little work; but remained idle most of the time and preferred to stay indoors. In fact he remained in the house for one whole winter. He complained of people following him on the street; they called him a "pickpocket." A few weeks before admission to M. S. H. he said that it was useless for him to live; that he wanted to kill himself, and looked for a knife. On May 3, 1924, he grabbed a knife and attempted to cut his own and his mother's throat; he was at once taken to Bellevue Hospital where he said: "It's all an incomplete memory . . . it's unbearable at home (because of his incestuous impulses) . . . my mother is good to me in a way . . . *my mother controls me by an invisible will* (a projection of his own incestuous longing for his mother) . . . I don't think my mother would like me to be a good boy . . . I very rarely communicate with her . . . I don't speak her mystic cult . . . I'm innocent . . . I was corrupted at my mother's hand taking a picture of me when I was two years old . . ." At M. S. H. he said that his mother got him to attack his father with an axe (compare with Noel case in New Jersey who attacked his father with a hammer; he is a case of schizophrenia). He was indifferent, showed stiff affect, incoherent, and reacted to audi-

¹¹ Abbreviation for Manhattan State Hospital.

tory hallucinations. When his father visited him, he attempted to kick him, and when reprimanded for this, calmly replied: "He is not my father; he is a relative." On another occasion, he hugged and kissed his mother on the ward for a short time and when she proceeded to walk away from him, he impulsively took her by the shoulders, pushed her into one of the ward rooms, took out his penis (which was erect) and attempted to have coitus with her. The ward attendant just saved the mother in the nick of time. The following morning the patient denied all knowledge of the incident. The patient's sister informed me that the attachment between mother and son was very profound and mutual. The homosexual element in the case seemed to be more in the background; he has great antipathy toward discussing that subject.

W. D.'s mother still regards him as a baby and constantly makes him the recipient of her motherly concern and emotional outlet. Through a combination of his mother's emotional stimuli and the natural increase of his sexual impulses at puberty, the incestuous fixation on the mother began to assert itself, and gradually ushered in the psychosis. In my experience it is unusual for schizophrenics to make actual sexual assaults upon the mother; they are more apt to display a sadistic attitude and beat her up, or expose themselves to her, or try to see her naked. Among several thousand schizophrenics, I recall only two cases who actually attempted a sexual assault on their mother. W. D. is a case of schizophrenia paranoides (*dementia praecox*—paranoid type).

Case II. R. W. Admitted to M. S. H. January 5, 1924. Age nine-teen years. Born in U. S. Student. Single. R. W. was considered perfectly well mentally until four and one-half years prior to his commitment. About that time he enlisted in the U. S. Navy. The psychosis was precipitated out of a certain homosexual setting which he was thrown in contact with while in the Navy. While there he met a prize-fighter X whom he looked up to as a hero. X was exceedingly fond of the patient, gave him presents, and in many other ways showed him attention. By degrees X became more familiar, taking such liberties as pressing himself against the patient's buttocks, "goosing" him, or trying to grasp his genital. On one occasion X said to the patient: "You would make a nice woman because you have such red cheeks." He often begged the patient to sleep with him, and once tried to kiss him. If the patient happened to be lying on his abdomen, X would come along and pinch his buttocks. Finally X asked the patient to be the submissive partner in homosexual intercourse; the patient, however, firmly refused to grant this request. R. W. admits that he was much attached to X, and often felt like giving in; but his conscience would not let him. Once he put his bed next to X's to see what he would do. The patient said he was

terribly afraid to be in the shower when X was there; he preferred to be reprimanded for not bathing rather than have such a situation arise. While in the Navy he heard considerable gossip among the sailors about homosexual matters; they would tell each other about their homosexual relationships with different men and praised the erotic qualities of a certain boy on the warship. R. W. was also approached on several occasions by other sailors; but always declined. He was jealous of anyone who was friendly with X. Thoughts and phantasies about homosexual situations constantly passed through his mind. Finally he began to imagine that men followed him on the street, especially, as he thought, it was common knowledge that men did homosexual acts with sailors. R. W. said: "I thought they would follow me because I was a pretty good looking fellow . . . (this shows his unconscious longing for such a situation) . . . I thought that men looked at me and thought I was good for sexual relations with men . . . I imagined that men on the street pointed me out and said I was a "c. s." . . . I imagined that men on the street wanted me to come up to their room to "jazz" me" (his unconscious wish for it). R. W. admits contemplating suicide over a period of three weeks because he had no more interest in life, since it had nothing to offer him; because he had an impulse (fellatio, probably) to do something which he did not recall; but would rather die than to have gratified it. Things on the ship got so that X used to ask the patient to sleep with him nearly every night. R. W. was finally arrested for arming himself with a gun to protect him against his persecutors on the street and sent to a hospital whence he was transferred to M. S. H. At M. S. H. he often felt that someone was coming up from behind to "goose" him; he smelt the odor of semen in the air. When he ate corn, the thought came to him that it looked like semen. "Whenever I was with a girl, I could not talk, blushed, and felt like a fool; I used to think that my mother wanted to make a "boob" out of me in company; sometimes I felt that she did not like me; but cannot say why." The patient said that he had missed many opportunities for heterosexual intercourse because the thought would come to his mind under such circumstances that his mother told him not to, and he had to obey. He frequently pictured his mother standing before him with upraised hand, forbidding him to have anything to do with a woman. He sometimes felt that his mother was jealous of him. Once he had a heterosexual dream and deliberately stopped the ejaculation stating that he was frightened. (The dream was unquestionably incestuous.) Occasionally he had homosexual dreams; but could not recall what part he took in the relationship. In a very coarse, depreciatory manner, he expressed a desire to have intercourse with a "Jane"; he believed that it would cure him; but felt he would not be able to consummate the sexual act with a woman. On one occasion he did try to have sexual intercourse with a girl; but was im-

potent. On another occasion he dreamt of wrestling with another patient. His free-associations to "wrestling" were as follows: "Jazzing a fellow, kissing him, throwing him around, using my muscles, . . . lying down and jazzing, playing with sailors, thinking of fighting, my mother, kissing her, maybe jazzing her, my mother, running around with Ben (his brother), I like big guys, at times it comes to my mind to jazz my mother" . . . "It was about four years ago I first noticed that I wanted to avoid embracing my mother (defense against incest), sometimes when she would embrace me, she would hug me tightly for half an hour if I would let her. When I would look at my mother's leg for a moment the idea of having sexual intercourse with her comes to my mind." It is also interesting that on one occasion the patient spontaneously said to me that at times he felt like a king (symptom of regression to narcissism); but from his present situation in the hospital he knew that this was only an imagination (such insight is very unusual). The patient admitted to me that when he was twelve years old he had pederastic relations with another boy of about his own age; there was only one episode of this sort. The patient does not believe that he is a homosexual and could not be convinced that unconscious homosexual impulses had anything to do with his mental disorder.

R. W., in short, is a latent homosexual (one who is unconscious of his homoerotic component). The homosexual environment in the Navy brought out and offered gratification to his repressed homosexual component; he declined the invitation because it was against his ideals; the repression of the impulse was diminished, but not entirely abolished, and he reacted with defense mechanisms. His ideas about people calling him a "c.s." were due to the activity of that stern inner judge, his conscience, which correctly sized up the intrapsychic situation and warned him. R. W. always smiled at me when I told him that some of his symptoms were due to a repression of homosexual impulses, stating that in the hospital he had no sexual inclination for either sex; this is undoubtedly true because in his present narcissistic state (he feels as though he were a king) he loves only himself. It is not infrequent that one can trace the beginning of a schizophrenia to a homosexual situation in the Army, Navy, or on a steamship when the patient is a latent homosexual. When one considers how helpless R. W. was against his impulses, we must agree with Oscar Wilde: "It was the passions about whose origin we deceived ourselves that tyrannized most strongly over us." In considering the emotional effect of X on R. W. how appropriate is the following bit of Oscar Wilde: "Well, after I had been in the room about ten minutes, talking to huge overdressed dowagers and tedious academicians, I suddenly became conscious that someone was looking

at me. I turned halfway round, and saw Dorian Gray for the first time. When our eyes met, I felt that I was growing pale. A curious sensation of terror came over me. I knew that I had come face to face with someone whose mere personality was so fascinating that, if I allowed it to do so, it would absorb my whole nature, my whole soul, my very art itself. I did not want any external influence in my life. You know yourself, Harry, how independent I am by nature. I have always been my own master; had at least always been so, till I met Dorian Gray. Then . . . but I don't know how to explain it to you. Something seemed to tell me that I was on the verge of a terrible crisis in my life. I had a strange feeling that Fate had in store for me exquisite joys and exquisite sorrows. I grew afraid, and turned to quit the room. It was not conscience that made me do so; it was a sort of cowardice, I take no credit to myself for trying to escape." A psychiatric study of the effect of a homosexual upon a latent homosexual, as in the case of R. W., will answer the question put to Dorian Gray: "Why is your friendship so fatal to young men? There was that wretched boy in the guards who committed suicide. You were his great friend." The diagnosis in the case of R. W. is schizophrenia paranoides.

Case III. L. E. Admitted to M. S. H. August 6, 1925. Age twenty-six years. Born in U. S. Common school education. Single. Business man. One sister is an idiot. As a child, L. E. was an "ideal boy," and according to his sister "was all for his mother; and anything he could do for her, he did." He never bothered with other women. Whenever his sister spoke to him about this, he would answer: "My mother is good enough for me. My mother is my best girl." He was very careful with his money and saved it so that he might some day be able to build a home for his mother. His social activities were entirely confined to men. He was greatly attached to and solicitous of the welfare of his younger sister Alice (a mother imago). Four years ago when Alice was sitting on the porch with a male friend, at about 10:00 p.m. he requested her to come into the house as it was getting late. She told him to mind his own business, whereupon L. E. became angry and threw some water on her. In August, 1924, after attending to some wants of his sick mother, he came back to her bedside and found her unconscious. He immediately became very much upset. After a week his mother died, and he again became upset, even wanted to jump out of the window, saying: "Well, I have lost my best friend in the world and I might as well end it all, I don't want to live any longer; my best friend is dead." At the funeral he clung to his sister Anna (the informant) saying that he was afraid she might jump into the grave (a projection of his own wish to do so). In March, 1925, he became interested in a

young married woman, Mary, much to the surprise of his own family; this was the first time that he had ever shown an interest for any woman outside of his own family. In June, 1925, his sister Anna asked him when he was going to get married. He replied that he did not think he would get married because he had taken Mary out a good deal, spent a lot of money on her, and had asked her to keep company with him exclusively; then had discovered that she kept company with other men, was married, and being a Catholic could not obtain a divorce. One day in July, 1925, while in his store he was seen by the janitor of the opposite building embracing Mary. The following day this *janitor jokingly remarked to L. E. that Mary was getting fat*. That remark appears to have precipitated the psychosis, because the patient became very much worried and depressed, imagined that Mary was pregnant by him, told his brother-in-law that she was trying to rope him in by saying that he had impregnated her. L. E.'s relatives brought Mary to him to see if her statements would eradicate this delusion; she denied that he had ever had sexual relations with her, and offered to submit to a physician's examination to prove that she was not pregnant, but all this was of no avail; the patient continued to cling to his delusion. About two days after the janitor's remark, L. E. came home and said to himself: "What did you do with that woman? She is getting pregnant." He also referred to the janitor's remark. Then said to his sister: "What do you think? A woman came up and wanted me to sign a paper. I bet she came up with the marriage license to sign." I asked the patient's sister Anna whether the patient attributed the pregnancy idea to the janitor's remark and she replied that he had. Shortly after that, when his youngest sister, Ida, his father, and he were in the house together, L. E. suddenly said: "You can't tell me that Mary is not in the house; she is dressed up like Alice (who is the image of his mother and resembles Mary in many ways). On the morning of July 22, 1925, while reading a newspaper, he said: "Look at this paper. It is all over about Mary and I." He Also remarked that his youngest sister, Ida, was the offspring of himself and Mary. That same day he went to the bathroom and cut his throat. When asked why he did it, said: "I don't know. I went out of my head. I want to die. There is no use living. Something came in my head and I cut my throat." L. E. was then rushed to a nearby hospital. Three days later when he was visited by his sister Anna, he said: "See that girl over there? (pointing to a nurse). That is Mary dressed up as a nurse" (mother symbol). He was then transferred to Bellevue Hospital where he was described as: dull, depressed, lay in bed with his eyes closed, whispered to himself as if reacting to auditory hallucinations. He said: "For three months a girl has been on my mind . . . fine girl . . . I began worrying and I cut my throat . . . she is in a family way . . . I felt responsible . . . I never had relations with her and she did not accuse me . . . people began to read my mind . . . they send me messages by wireless, in words,

not code . . . when I walk on the street people make remarks . . . they look at me . . . it goes through me like electricity." On admission to M. S. H., he said in answer to the question why he cut his throat: "I don't know myself, my mind was working, I was upset . . . something came in my head and I cut my throat . . . I said 'to hell with everything' and cut my neck . . . people on the street were looking at me as if I killed somebody (this is probably due to a guilty conscience over death wishes against his father during childhood). I got into trouble on account of a girl . . . she is in a family way . . . she said she would get me and she did get me . . . I saw her five or six times . . . I drank coffee, coffee, coffee . . . smoked cigarettes (oral erotic symbolism) until I didn't know what I was doing . . . after a time I saw spirits of people looking behind me . . . they worked on me with dope, poison, and everything . . . my whole body is gone . . . I was sure down-hearted" (patient begins to cry). When asked why he was crying he replied: "When I lost my mother, I didn't give a damn what I did." Did you have any visions? "I used to see mother in my dreams." Later on he went into a stuporous state and his only productions were occasional stereotyped phrases repeated over and over again in a monotonous manner, e.g. "I never made a single soul in the world." On one occasion he became very disturbed and required restraint. During this period he admitted to me that Alice (mother imago) was his favorite sister.

L. E.'s psychosis was precipitated by the remark of a janitor which was associated with one of his deepest, incestuous, childhood wishes, to wit, to present his mother with a child. Mary and his sister, Alice, are both mother imagines, that is why during the early part of his psychosis he thought that Mary was in the house dressed up as Alice, why he thought that his youngest sister Ida was the offspring of himself and Mary, and also why he thought that a hospital nurse was Mary dressed up as a nurse (mother symbol). Regarding the resemblance of Mary and Alice to each other and to the patient's mother, L. E.'s sister, Anna, gives the following: "My sister Alice looks a great deal like her mother and has her ways. Both Mary and Alice have the same blonde hair and blue eyes. My mother was inclined to be well built and buxom. I saw pictures of my mother when she was young and she is the living image of Alice. Mary is a jolly sort of a girl and liked to have a good time. Alice resembles her in that way. Alice resembles Mary physically. My mother was a rather sociable jolly woman." The original incestuous attachment of L. E. to his mother was also transferred in a measure to Alice and then to the mother-sister imago, Mary; this explains, to my mind, why Mary was the first woman outside of L. E.'s family

who attracted him sufficiently to cause him to think of marriage, and, being a psychologically unhealthy type of love, was capable of precipitating a psychosis. The diagnosis made in this case is: schizophrenia—catatonic type.

Case IV. S. H. Admitted to M. S. H. Oct. 22, 1922. Age twenty-eight years. Born in U. S. Mulatto (mother is white). Single. Common school education. Porter. According to relatives, the patient displayed no mental symptoms during childhood. He never manifested any interest for the opposite sex, except for little blonde girls. In the presence of women he was shy and bashful. There was considerable attachment to his mother. In his contact with people, he was somewhat shy and unsociable, although has for a number of years had a male chum toward whom he is still very friendly. At the age of twenty-three years, he made two unsuccessful attempts at heterosexual intercourse with a negress, but was impotent in both instances (sexual impotence is a very common history in cases of schizophrenia). He finally gave up women in disgust, and never attempted to have heterosexual relations again. When he was nineteen years old he had sexual relations with a twelve year old blonde girl, but could not get an erection of the penis. Between the age of sixteen and seventeen years, he had homosexual relations with a young male friend—fellatio and pederasty. He could not reconcile himself to that form of sexual gratification. Since that time he has not indulged in such relations. *The onset of the present psychosis was given as a year before his admission to M. S. H.; he had been approached on the street by a male prostitute who offered his services for money, but S. H. declined the invitation.* From that time his unsociable tendencies became more pronounced; he lost interest in himself and the things of the world, preferred to stay at home. Two months before admission he began to speak a good deal about "she-blood"; thought that men, especially Italians, were after him; imagined that the men in his neighborhood gossiped about his homosexual tendencies; and spoke about being transformed from a man into a woman. He would sing almost constantly: "I'm a 'he-she!'" He complained of men across the street drawing the "she-blood" from him to be distributed among all the other men; and told his mother that at night, while in bed, men were drawing him by electricity. (He is referring to involuntary seminal emissions.) He talked a great deal to himself. On one occasion, he put on his mother's dress, and shoes and stockings belonging to his sister; he asked for a pair of corsets. He expressed a wish to go on the stage in order that he might be a "she-man." Towards his mother he became very threatening at times, stating that he had a "good mind to smash her," and said that she was his greatest enemy. One day he came to his mother and said that his breasts and abdomen were enlarging and that he had felt motherhood (identification with his mother and impregnation phantasy); that certain men sucked his blood and sapped his man-

hood from him. On the ward at M. S. H. the patient was quiet, well behaved, and inclined to be unsociable. After a few weeks of hospital residence he employed himself satisfactorily. He answered questions promptly, although at times was somewhat incoherent and irrelevant. There appeared to be little interest for anything; he was indifferent and his emotional reactions were stiff and rigid; he said he was contented with his lot. Orientation and memory were unimpaired and he appreciated his surroundings. No insight. He spoke of men drawing him from a distance, causing him to have an erection of the penis with seminal emission. He admitted that frequently an impulse to perform fellatio came to him; that at times he felt as though he had a child in his abdomen; that he wanted to be a woman and believed that he would be transformed into one. In the privacy of his own room, he often dressed up in female attire, masturbated, and imagined that he was assaulted by a man and forced to perform fellatio. The patient would have periods when he actually believed that he had been transformed into a woman. In discussing the situation with the patient several months after admission, he informed me that the auditory hallucinations that people called him: "c. s.," "fairy," and a "woman," disappeared a week after admission to this hospital; that for the first five months after admission he had visual hallucinations of an erotic nature. The visual hallucinations occurred mostly at night while he was still awake; they were undisguised wish fulfilling hallucinations of his suppressed homosexual desires and were accompanied by seminal emission; he usually hallucinated being forced to perform fellatio. Before coming to the hospital he felt that he was being followed by men who wished to have sexual relations with him. Certain types of men could read his homosexual thoughts, and knew that he was a "c. s.," a "she-man." Since his fourteenth year, the patient has from time to time been cognizant of a passion for certain men. At irregular intervals the passion for men and a desire to perform fellatio overtake him; it is with difficulty that he controls these impulses. During such periods he is depressed and very irritable. S. H.'s homosexual impulses are quite conscious but are suppressed; he cannot reconcile himself to them. At various places where he was employed, he would develop an affection for one of his fellow employees, and would have such difficulty in suppressing it that he would have to give up his job. (In other schizophrenics, a defense reaction toward the opposite pole, in the form of hate, is built on the flimsiest, almost imaginary wrongs and developed into a degree where the patient actually believes he is disliked by his fellow employees or that they actively persecute him; then they give up their positions one after another.) Occasionally he felt that all the men on the street were fond of and attracted to him (an example of his narcissism). He refers to his homosexual tendencies as the "she-blood." On leaving the hospital for parole he had rather good insight into his homosexual impulses, but said he would never gratify them;

he was willing to discuss them with me because he felt that I understood him. The rather good insight into and his willingness to discuss his sexual situation accounts for the frank, undisguised, wish-fulfillment nature of his psychosis. He also realized that these impulses were at the bottom of his psychosis, although on admission his understanding of the situation was not so good. I feel that my conversations with him had a great deal to do with his good understanding of the matter. When the homosexual impulses were in abeyance his emotional reaction was not so stiff as it was on admission. His conversation was free from incoherence and irrelevancy. A note made on Oct. 22, 1923 by the parole physician states that he insists on having his mother buy him women's underwear, pleads with her to purchase it for him. He continually looks into the mirror (narcissism), uses his mother's cold cream and rouge. He likes to wear ladies' high heeled French shoes.

In this case the identification with the mother is quite apparent; in assuming this rôle he takes on the attitude of a woman in his sexual life. The mouth apparently acquires for him the function of a female genital. In spite of the more or less conscious nature of his homosexual impulses, he suppresses them; volitional control was undoubtedly assisted in a measure by a prolonged "introversion reflex" manifested by his seclusive tendencies and stiff affect. The meeting with the male prostitute and its offer of gratification being a stimulation for the repressed impulses upset his emotional equilibrium and fairly adequate adjustment to his impulses; the only way he could prevent himself from giving in to them was by voluntarily reinforcing his "introversion reflex" to such a degree that complete introversion took place and the libido dissipated itself in wishfulfilling erotic delusions and visual hallucinations. The diagnosis in the case of S. H. is schizophrenia paranoides.

(To be continued)

PSYCHOSES IN CRIMINALS: CLINICAL STUDIES IN THE PSYCHOPATHOLOGY OF CRIME *

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I-C. THE CRIMINAL PSYCHONEUROTIC

The fundamental difficulties with which the psychoneurotic is so heavily burdened reveal clearly that his criminal behavior represents a vicarious and ill-sustained effort to effect some form of sexual adjustment at an acceptable social level and thus maintain his touch with reality, in spite of fundamental burdens and tendencies to regression; his antisocial behavior, rather an offense than a crime, being the outward expression of repressed conflicts that have broken through in the form of irresistible impulses, thus betraying a total failure to effect any sexual adjustment.

As a group, psychoneurotics are quite clear from psychopathic difficulties. The offense is quite frequently of a sexual nature, directly or indirectly so. When it is not outwardly so it will usually be found to be secondary and incidental to the major difficulty, which is sexual. Being psychogenically conditioned and motivated, the criminal and antisocial behavior of the individuals expresses in a particular manner a specific underlying difficulty; hence the individual in this group—more so perhaps than in any other group—is almost invariably guilty of one type of offense only.

The psychosexual difficulties of the individuals in this group can often be traced to regressive fixations, and are expressed in the form of gross, excessive sexuality or other homosexual adaptations, express or latent, which led to the commission of the crime, thus showing that neuroses, psychoses, and criminality possess a common origin and background. As a group these individuals belong more frequently to the epileptic and hysterical types, a history of episodic reactions and neuropsychic concomitants characteristic of these types, often being found among them, even before confinement.

Heavily burdened as they are, and possessing the very soil upon which psychoses develop, these individuals not infrequently break down in the prison environment and furnish not an inconsiderable number of situational reactions. However, on recovery, which is

usually quite prompt, their fundamental difficulties appear to be wholly unaltered.

The case of Lawrence Fisher is illustrative and shows by contrast the difference in the personalities concerned. He came under our observation at the age of twenty-three years. His personal history is unusually good; the man is bright, intelligent, and brought up under good home surroundings. Knew nothing of sexual matters until fourteen years of age, when he was informed by other boys. At seventeen, in company with some boys, he visited a house of prostitution and it came natural for him to perform cunnilingus instead of normal intercourse. Subsequently he repeatedly performed cunnilingus with prostitutes but denies masturbation and other sexual perversions. He has never had a complete erection, although there has been at times a discharge of thin fluid from the penis, but no complete orgasm. At intervals of a month or longer he would have a marked sexual desire noted by heaviness in head which was relieved if he could perform his perversion. He could also obtain some gratification from female underclothing, especially if he could put it in his mouth. On one occasion he wrote a letter to one of his neighbors threatening to burn his house if the man did not place some undergarments of his fourteen-year-old daughter on a fence near the house. He was arrested but released after having given a bond to keep the peace for one year.

When the segregated section of the city was abolished and the woman left the city, he was unable to find another woman to patronize. One day he was in a park and induced a little girl of six to sit on his head, and while in this position he performed his perversion on her. Arrested, and although apparently greatly shocked and confused, he soon regained his normal balance. From an interview it appeared that the patient realized the wrongness of the act but stated that sexual desires made him impulsive. He feels sorry and ashamed of it, and states that his whole life is a great battle, a conflict between his conscience and his abnormal desires.

I-D. THE CRIMINAL PSYCHOTIC

The individual suffering from psychosis and who, by reason of the same, comes in conflict with law before he is admitted to a hospital, is not an unfamiliar figure among us. We meet him frequently in the paranoid type, who arms himself with a pistol as a protection against his imaginary enemies, although this example does not by any means exhaust the great variety encountered in this group. Taking it all in all, we find here criminality and antisocial behavior

with a criminal coloring developing in individuals essentially psychotic; as a result of their instinctive and abnormal cravings they come into conflict with established social norms, as in the instance of affective disturbances, paranoid trends, regressive tendencies and deterioration leading to lower and vicarious forms of adjustment. These individuals are not essentially different from the usual run of psychiatric hospital population and find their way into prison because of their psychotic behavior showing such decidedly criminalistic tendencies. In this group are also to be found prisoners not originally psychotic, who, while in prison, develop organic brain diseases, such as general paresis, as well as various types of misfits who come into conflict with the law in their prepsychotic stage and whose psychoses have fully developed following confinement, and therefore are not to be confused with situational reactions. Here, then, the psychosis is directly and definitely related to the crime, standing in relation of cause and effect. These cases are remarkably free from the effects of prison life; they seldom develop pronounced paranoid elaborations as regards their immediate environment or other psychotic prison manifestations. In these cases the psychosis progresses in its usual manner as in any institution, although very rarely the confinement and the commission of the crime may give the original psychosis a situational coloring that at times may be so marked as to even obscure and overshadow the basic difficulty. The crimes and offenses in this group are usually of a very serious nature, assault and murder being particularly frequent, the crime itself often being quite premeditated. They seldom deny the commission of the crime but, on the contrary, try to justify it in the usual psychotic manner.

As an instance we may take the case of George Williams. George has shown a peculiar make-up since early age. A bit feminine in his appearance, he has always been rather seclusive and shut-in, given a great deal to day-dreaming, never caring to associate with other children or to take part in their games. History discloses a few homosexual episodes, but the practices were promptly given up when he was discovered and severely reprimanded by his father; there is also a history of excessive masturbation. On reaching the age of puberty and for several years following, it appeared that George could not very well adapt himself to work. To be sure, the home situation was not very good. Father and mother never got along very well and frequently quarreled in the presence of the boy. In addition, father is a heavy alcoholic and of a disagreeable disposition, constantly nagging the boy for not bringing enough money home; and the overaffectionate mother would take the boy's part in the affair and he would always go to the mother for protection against his father's abuses. She felt that the boy would have gotten along perfectly well at work had it not been for the father and bad associations. In the office George thought he was not being treated right and in fact he himself

once heard some rather unpleasant remarks made about him by some of his co-workers; of late he has heard these more frequently. Not only in the office but even on the street it seemed to him that people threw peculiar glances at him and made some ugly remarks which irritated him a great deal, but the nature of which he would not disclose. In time the circle of his enemies seems to be enlarging, the remarks are becoming louder and uglier, and finally George decides to protect himself against his enemies. He buys a revolver which he carries with him at all times. One day while in the office he heard some one make a particularly ugly remark about him. George promptly drew the revolver and shot at the man, inflicting two wounds, fortunately not fatal. He was arrested, tried and given sentence of five years for assault with intent to kill.

In prison we find him a model prisoner, quiet and well behaved; a fairly good worker and apparently not particularly chafing under the prison regime, although somehow or other unable to get along well with either the prison authorities or fellow prisoners. The authorities, he thinks, are deliberately putting poison in his food and he could even see the crystals of strychnine in the plate of soup; while the fellow prisoners, encouraged by the gang outside, are making slanderous remarks about him, accusing him of immoral practices. On account of these ideas George has come into several fistic encounters with his fellow prisoners and was punished for that by the removal of all privileges, restriction of diet and isolation in a cell. However, the punishment did not seem to have the slightest effect on him and he continued to be delusional. On one occasion he was barely prevented from committing suicide and violently fought the guard who tried to stop him from carrying the attempt to complete execution. He then refused to eat, claiming that he might as well be dead as to live among his enemies and eat the food which slowly poisons him. It was clear that the man was a psychotic and it was necessary to transfer him to a hospital for the criminal insane. On being transferred there his behavior did not appear to have shown any change. At the expiration of his sentence, he was transferred to non-criminal ward where his psychosis continued unchanged. His subsequent stay in the hospital was not in any sensible degree different from that of any other psychotic who remains in the hospital until the end of his days.

II. THE EXOGENOUS REACTION TYPES IN PRISONERS

(The True Prison Psychoses: The Situational or Reactive Psychoses in Prisoners)

In marked contrast to the group just spoken of, there is another group of criminal insane which, as a whole, differs considerably from it in the original personality make-up, the psychotic reaction exhibited, and the relation that exists between psychosis and crime. Whereas in the former group the psychosis directly conditions the crime and is in itself but little influenced by the consequences thereof, the relation seems to be wholly reversed in the instance of the second group. Here, irrespective of the original cause of crime, we find crime and

more particularly the confinement conditioning the psychotic reaction. Thus the setting in which the crime is committed, and more strikingly the situation which necessarily follows its commission and the psychic reaction towards the situation, stand in the direct relation of cause and effect. Depending thus for their very existence and continuation upon the presence of the particular situation, these reactions must be recognized as standing apart and being quite different in character from the usual run of psychoses. They represent, in a much exaggerated form, the reaction which any normal man may be expected to exhibit when placed in a stressful situation; hence, in a sense, these reactions, so aptly termed situational, form the connecting link between the normal and abnormal.

But, it may well be asked, why regard these as situational reactions? Is there not present in every psychosis a situation which, in varying degree, seems to play an important rôle in the causation and precipitation of the psychosis; and is not, therefore, every psychosis in a sense also situational psychosis? To this it may be answered that while all this is true in a sense, there is, nevertheless, a marked difference between the situations as the direct causative factors of a psychosis and the situation merely acting as an exciting or aggravating factor. An illustration will probably make the point clearer:

John Smith contracts lues and is well on the road to develop general paresis, which, under normal conditions, would have appeared, we will say, ten years following the initial infection. But here comes the war and John is sent overseas. The stress and strain of it proves too much for him, he breaks down and develops general paresis four years following the initial infection. Here it is obvious that, although the war has in a way been responsible for the breaking out of psychosis, it had in fact merely hastened the appearance of that which by reason of the earlier presence of a very potent destructive agent was bound to appear sooner or later anyway. Hence, although the war was one of the exciting factors, it was as such only of secondary importance, the primary factor lying within the individual. Similarly other psychoses, organic as well as functional, that are conditioned primarily by a very defective background, must be conceived as being essentially endogenous in origin.

We may return now once again to the case of George Williams, the paranoid precox who by reason of his delusional ideas attempted to kill another individual, one of his imaginary persecutors. This type of case is quite commonly observed in our criminal population. The particular point or question is, how far were the various situations which the patient met in life responsible for his pathological mental reactions? To begin with, we are dealing here with an individual clearly showing an abnormal make-up and behavior since an

early age, and it is equally clear that his inability to get along well at work is not in any way traceable to the home situation, bad as it was; that is to say, irrespective of the home situation, he would undoubtedly have developed the same difficulties. Indeed, not at all infrequently we have similar behavior developing in homes where the situation is not only ordinarily good, but is better than in the average home. Evidently we are dealing here with a very large constitutional element, and his inability to get along in the office was predicated by the hallucinatory experiences and delusional formations clearly of endogenous origin, these apparently having but little to do with or influenced by the particular setting in which it expressed itself. The crime, too, was obviously a crystallization of the various psychotic manifestations that have been going on for months and years previously, and have in fact directly led to the commission of the crime. On being imprisoned he does not appear to have shown any marked affective reaction to the confinement, a situation which in a normal individual frequently arouses a very profound reaction; and his paranoid elaborations in prison, both in content and character, appear to be merely extensions of the delusions entertained previous to arrest, and, judging from the content, are not in the least influenced by the environment. Here, then, we have an instance where the crime is the direct result of behavior primarily psychotic, due to difficulties within the individual and not the result of an acute and stressful situation external to him; the removal of the situation does not affect the development and expression of the psychosis, and the man's psychosis would have developed irrespective of any particular situation with which he was confronted. The situation here may have somewhat colored his reaction, and the happenings in the environment may have furnished some of the content for his delusions and hallucinations, but taken in a longitudinal section, the psychosis is obviously of endogenous origin, one that would commonly be classified as paranoid dementia precox, not essentially different from similar types of psychoses met with in any psychiatric institution; and the situation or set of situations, however stressful they may seem to have been, were of very minor importance. The essential situation, if any may be so stated, is largely, if not entirely, within the individual himself, and the difficulties are primarily of an endogenous nature; the man, as it were, is imprisoned within himself by his own conflicts.

Quite different, however, are the psychoses which appear to be direct results of stressful situations. Of these, there is a large variety which, however, may be classified into several major groups.

II-A. THE (MORE PREDOMINANTLY) SCHIZOPHRENIC REACTION TYPES

By far the most frequent type of reaction displayed by prisoners and incident to confinement is that of schizophrenia (not to be confused with dementia precox), of which there are several broad subdivisions.

II-A-1. *The Malingering Reactions*

Joseph Green is a young colored male serving a five-year sentence for post office robbery. It is quite impossible to obtain from him any history of his life as he is thoroughly unreliable in every statement he makes. Records from jail describe violent outbreaks and homicidal tendencies. On admission to the hospital he stated he heard the people who arrested him say that they were going to choke him with a rope. He seemed very anxious for his release and was repeatedly discovered plotting to escape. On several occasions he refused to eat, giving as his reason that he was angry with the doctor who was trying to poison him. He is a pathological liar, giving the most grotesque and fanciful explanations for his deeds, with a tendency, however, to always fix the blame on some one else. As a rule he showed a fairly normal behavior when not observed by the physician; however, in the latter's presence, he would manifest almost complete disorientation, loss of memory, answering questions wrongly and differently on repetition; spontaneously and at every opportunity, describing a great variety of neurological symptoms, claiming hemiparesis and hemianesthesia, etc., although as observed by nurses he had full control of both arms and legs. He had several spells resembling epilepsy, but there was no frothing at the mouth or actual convulsions; next day he would show the physician a wounded tongue to convince him of the genuineness of the attack.

In this instance, then, we have a man of very unstable make-up who, as a reaction to confinement, developed violent outbreaks and paranoid ideas projected on the immediate prison environment; and mixed with these there was often observed malingering, a type of behavior which, although largely consciously initiated and apparently intended to serve a definite purpose, must be regarded as having essentially psychotic aspect; the very ability to so behave betrays an exceedingly labile personality.

We may, therefore, say that, contrary to the generally accepted popular notion, malingering should not be regarded as wilful and conscious lying on the part of a well balanced individual, but rather as quite an unconscious defense reaction in one who, already burdened with constitutional defects and many psychogenic difficulties, is a psychically ill individual, and who, unable by reason of these defects and burdens to handle a situation in an adequate manner, seeks in malingering an avenue of escape from the situation. Hence,

the very adoption of malingering as a means of adjustment is in itself already suggestive of an abnormal personality. The intimate relationship between malingering and the underlying psychopathic burdens is nowhere more clearly seen than in the ease with which malingering passes into behavior that is distinctly psychotic, and the line between the two is hard to draw; the differential diagnosis between malingering and psychosis often being not only difficult but quite impossible, for they apparently represent successive stages in the development of the same reaction. Frequently enough we can see before our very eyes how malingering passes into behavior definitely hysterical or develops into an excitement, schizophrenia, confusion, delirium, stupor, and other reaction types that clearly bear the stamp of a true psychosis of a situational nature. The relation of malingering to a particular situation and its dependence thereon is seen in the character and content of the reactive manifestations as well as in the outcome which depends essentially upon the maintenance or the disappearance of the situation. The malingering psychoses may be observed in a great variety of forms, and we often find malingering without psychosis, malingering passing into psychosis, malingering intermixed with psychosis, as well as malingering appearing as a sequel of psychosis.

II-A-2. *The Situational Psychoses Proper*

Let us now turn for a moment to the case of Henry Brown. He is forty years old, a merchant by occupation, married, has three children; family life apparently good and not remarkably different from what we meet in the average home. He occupies a good social position and stands well in the estimation of his fellow men. His personal history is uneventful, his heredity appears to be quite negative; has never been arrested or otherwise been in conflict with law and society. Of his inner life we know that for the last five years Mr. Brown has been very intimate with Mrs. Alvin R. Johnson, nee Elizabeth Taylor. Henry and Elizabeth when younger were lovers and kept company for several years and secretly even planned to get married when Henry would establish himself financially. Somehow or other, however, things moved rather slowly with Henry and between supporting his widowed mother and his younger sister there was not much left at the end of the month. When Elizabeth's parents learned of this courtship they offered most violent objections on the ground that Brown was of a much lower social position and was in addition poor—the two cardinal sins of our society. Brown was told by the Taylors to sever all relations with Elizabeth and Elizabeth was prohibited from even thinking of Brown. And so they parted. Brown disappeared from the city and has not been heard of since by his friends. Rumor had it that following this affair Elizabeth suffered a serious nervous breakdown but this is not certain. Three years later, however, Elizabeth, after much coaxing and urging on the part of her parents, married Alvin Johnson

who was a very well-to-do merchant and had a large business interest in another city. She made a good wife and a good mother and outwardly there were no family difficulties—not more than in the average family.

Fate happened to throw the Johnsons in the city where Henry Brown has been living for the past ten years. Henry and Elizabeth once met accidentally at a social affair; what happened thereafter is not difficult to imagine; they followed their natural instincts and the old love relations were renewed. Everything went smoothly for five years when Johnson accidentally learned of the affair and one evening confronted Brown and his own wife with a revolver. A violent encounter ensued in which Brown happened to get the upper hand. He secured the revolver and his intentions were merely to disarm Johnson to protect himself and Elizabeth from further assault, let the consequences be what they might; but during the tussle the revolver discharged itself and wounded Johnson, inflicting a deep wound from which he died six hours later. Brown was arrested, tried and given a death sentence which was later commuted to life imprisonment.

For the first few days following Brown's arrival in the prison, nothing out of the ordinary was observed about him. He appeared to be slightly depressed, but hardly more than would be expected of anyone in his position. Later, however, he appeared to be somewhat perplexed, even confused, as if, for a while at least, he had lost understanding of himself and things about him; but these periods did not seem to last very long, at the beginning at least. He answered questions in a somewhat agitated manner and not infrequently tears were observed in his eyes. Then it was noticed that he became slow in his movements, was even seen sometimes to assume stiff attitudes; seemed much retarded in talk, in fact did not apparently care to enter into conversation, preferring to spend his time at a window, staring or gazing abstractedly into space, pupils dilated and eyes widely open. He ate but little and this too after coaxing. At night he was quite restless, sleeping but little; frequently getting out of bed and going to the corner of the cell where he would fall on his knees and pray for long periods of time; and he seldom prayed or went to church before. It was also observed on several occasions that he would become quite excited, shouting, screaming and yelling, cursing profusely at someone at the window—that man Johnson who is cursing him and wants to kill him; crying and begging to have his life saved. He would keep this up for hours even when put in restraint and then fall asleep apparently from exhaustion. Following one of these spells he did not quite wake up the next morning; in fact he appeared to be in a stuporous condition and although restraint was removed he remained absolutely passive and apparently wholly oblivious of his surroundings. He neither answered questions nor spoke spontaneously, was insensitive to any physical stimuli such as pin pricks and had to be tube fed. Transferred to a hospital for criminal insane, he continued in this state for about six months, presenting a picture of stupor, and then began to clear up. First he began to eat voluntarily, then talked and finally cleared up sufficiently to be able to partake in the various ward activities. At this time we find him clearly oriented in all fields, intelligence tests excellently responded to but with an almost complete amnesia for all that transpired during this period. Emotionally, however, he appeared quite depressed at all times. Three months later he was returned to prison where

he apparently made some sort of an adjustment as he has not been heard of since.

Here, then, we have an individual whose past life does not on the surface give the slightest evidence or even suggestion of any abnormality. He meets with an unusually stressful situation, enough to break the stoutest hearted, and, confronted with it, he breaks down. If it is reasonable to believe, and this seems to be well established, that an individual may develop a grave psychosis apparently because of some unsolved psychosexual difficulties dating back to earlier years, how much more reasonable it is to believe that an individual, suddenly deprived, by reason of confinement, of every form of his expression of his libido—personal, sexual and social, all that is good in life and makes life worth living should also break down and develop, as a reaction to such painful situation, a psychosis which merely expresses in distorted behavior and symbolic language the individual's inability to reconcile himself to his fate and thus adjust to reality. How clearly is the dynamogenic character of affect displayed here, showing that sharpest pain and deepest anguish underlie the very manifestation of such reaction and how completely the entire content of the psychosis seems to concern itself with the particular situation! How strikingly does this psychosis differ from the one previously described (George Williams, *q.v.*) in the personality make-up of the individuals, in the manner of onset, development, content, and relation to the environment; in fact, in all that goes to constitute a psychosis. Where, it may be asked, in the entire field of mental diseases do we observe instances of marked schizophrenic reactions associated with such tremendous display of affect that is not only present but clearly engineers and dominates the whole psychosis? Most frequently in prisons, of course. When in other psychoses we do meet such reactions as just described, we are often quite perplexed and puzzled, do not quite know where to put them or how adequately to diagnose them. In such instances we may well indeed suspect the presence of some acute emotional situation; for situational psychoses are not infrequently observed in everyday life but pass unrecognized, and are usually wrongly classified as dementia precox or are cross-indexed between dementia precox and manic-depressive psychosis; and, of course, they are far from being either, although perhaps approaching more nearly the latter.

In a sense all prison psychoses are situational reactions; but we may reserve the term of situational psychoses proper to reaction types developing in individuals not necessarily psychopathic and whose

present offense constitutes their first conflict with law; nor is there likely to be found a history of preëxisting neurotic, psychopathic, or psychotic behavior. More often it is the high-strung and temperamental individual whom, for lack of a better term, we may call the psychothymic individual. The individuals belonging to this group are usually found to be of a higher level of intelligence than the average patient and they frequently occupy a better social position as well. The crimes committed by such individuals are usually of a very serious nature, murder being particularly frequent. Antedating the crime there may often be found a difficult affective situation in a setting which leads to the commission of the crime under the stress of a great emotional storm or fiery passion. It is often the story that throbs with the most intense human interest; of the esoteric love affair and the swift retribution following it; of the great eternal dramatizations of the hopes and fears of the human heart in its many forms and subtle variants. Herein may also be found the individual wholly guiltless and innocent of the crime as well as the individuals who have either accidentally and unintentionally, or at least unavoidably, committed the crime and are given a life or long term sentence. Finally, any individual subjected to the stress and strain of a difficult situation may develop a transitory reaction, and this is particularly true of psychopathic personalities. The true psychoses do not necessarily exclude situational reactions, and they may at times be given a situational coloring or even so marked a situational aspect as to even obscure the original psychosis.

As a result of their conflict with law, and directly traceable to it, there soon develops (and but occasionally after a lapse of considerable time) a psychotic reaction, the nature and content of which seems to be clearly related to and is filled largely, if not entirely, with events of a situational moment; there being recognizable, even on the surface, the intrinsic relation between the confinement and psychosis. Through this psychosis the individual expresses either a complete abandonment of all effort, or more often a desperate and ceaseless struggle to entirely obliterate the painful situation from the focus of consciousness, and by substituting a psychotic elaboration increase thereby the chances to regain the dearly cherished freedom; it is the bridge of lost souls that unites yet separates the good and the beautiful from the hopeless and the terrible. Precipitated in an emotional situation, the whole reaction appears most conspicuously as an affect disturbance which colors the entire symptomatology. Quite characteristically a large number of cases belonging to this group develop an amnesia for the crime or the circumstances that have attended it

are so changed as to totally differ from the original situation and thus appear more as distorted elaborations rather than an actual description. Because we are dealing here with a great many individuals, each reacting in his own particular manner, and with a large variety of situations, each necessitating a different mode of adjustment, the situational psychoses manifest themselves in a great variety of forms, as varied in fact as the entire field of human behavior in its rich and infinite ramifications. They thus present a picture totally different from that ordinarily observed in the true psychoses. Unlike the true psychoses, the situational reactions are more understandable to the normal man and woman because they can dramatize the situation in terms of their own experience; and more clearly and characteristically the situational psychoses express the type of personality concerned. Then, too, although mixtures of reaction types occur frequently enough, the situational psychoses are quite often more definitely circumscribed; that is to say, a stupor is more likely to be a pure stupor without admixtures of psychotic concomitants other than those that belong directly to the particular type of reaction. Being situationally conditioned and depending for their very existence and continuation upon the presence of the situation, these psychoses are by very nature essentially benign in character, transient and short in duration, frequently disappearing with and often even before the removal of the particular situation.

On recovery these psychoses do not, as a rule, leave any noticeable residuals or scarring, but in less stable individuals, although the situation may have been a mild one, the psychosis or its residuals may persist even after the particular situation has been removed, thus betraying a more labile personality. On the other hand, even with a more stable personality, if the situation is one of great gravity, or has persisted for some time, or is of such nature that it cannot be immediately or permanently removed, making a normal adjustment impossible, the psychosis may become especially malignant and, by reason of the acuteness of the conflict, the overwhelming emotional upheaval and the tremendous strain it constantly exerts on the individual finally lead to regression and dementia, so that in its last stages its origin can hardly be recognized.

II-A-3. *The Regressive Prison Psychoses*

The effect of continuous confinement on the behavior of the individual is not always immediate or as apparent from the onset as described in the foregoing instances. Often enough, perhaps most

often, it is very insidious in its deteriorating effect, and the psychosis developing as a result of it is so slow in its onset that the latter can hardly be traced, while the development is followed with great difficulty. Unmistakably situational as these psychoses are in their origin, in their symptomatology they are more akin to the endogenous psychoses.

The instance of Early Young is a case in point. His heredity appears negative. As a boy he was of normal make-up, somewhat roving in disposition. No history of trauma, convulsions, psychotic episodes or previous conflicts with law. He left school in the fifth grade and went to work as a laborer. He was arrested on a charge of rape and although the charge was never proven, he was given a twenty-year sentence. The patient himself absolutely denied having perpetrated the act; the charge, he said, was trumped up by people he lived with. On arriving at prison he presented a normal appearance and for seven years nothing striking was observed about him. Then it appears that he gradually began losing his touch with his environment, had several outbreaks of excitement much in the nature of panic. On arriving at the hospital he appeared confused, showed a marked degree of dementia with loss of memory, disorientation, absurd delusions—abdomen filled with barking dogs, who were eating up his testicles, etc. He continued in this state for about three years when he began to improve and five years after admission he appeared in his normal state with, perhaps, some slight mental reduction as a residual.

We may, therefore, group under the regressive prison psychoses psychotic types appearing more often (although not necessarily so) in habitual criminals after repeated imprisonments or in other prisoners as a result of long confinement. The individuals in this group are more likely to be of a rather primitive intelligence, belonging in life to borderline cases whose adjustment, on the whole, is rather a feeble one and with a soil predisposed to the development of psychoses; in fact, the very commission of the crime often shows such gross faults in judgment as to reveal a mind that is all but psychotic already. Because of the prison confinement they gradually and sometimes even quite soon lose their touch with environment, and as a result of such dissociation from reality they regress and deteriorate, developing a multitude of psychotic manifestations.

As psychoses they stand midway between the true and the situational psychoses. In so far as their development is characteristically occasioned by the prison milieu and bear every evidence of being an affect disturbance, they clearly have a situational aspect. In so far, however, as the content is to a large extent regressive in nature—bizarre sex delusions are particularly frequent—they closely approach the true psychoses. In a sense the individuals in this group may be

regarded as the prisoners who, by reason of a particularly defective make-up, fail to develop an obvious situational reaction, but reacted instead to the situation with what would appear to be a true psychosis. Again, although the content of the regressive prison psychoses does not, at least overtly, appear to be of a situational nature, a more careful study will show much of it to be in the nature of a defense reaction to the particular situation. The onset of these psychoses is more likely to be rather insidious in character. Some of these cases seem to start with a definite situational reaction, which soon, however, disappears and is replaced by what appears to be a true psychosis and dementia, as if the patient had given up all struggle; again, it may take the form of a situational episode and disappear with the disappearance of the situation. More often than the true psychoses, but far less in frequency and degree than the true prison psychoses, the degenerative prison psychoses may have a situational coloring superimposed upon them. Much like the situational psychoses, the psychotic manifestations are more clearly delimited in nature; and, unlike the true psychoses, the type distribution is somewhat different, pure paranoid and catatonic types being relatively rare, while the grandiose or phantastic and the simple deteriorating types being the more predominant. Offenses against property and person are the prevalent forms of crime, sexual crimes being but rarely encountered here, their sexual life, at least superficially, not revealing anything strikingly peculiar, although frequently enough it is quite excessive. The duration of the disease is longer and the prognosis in these cases is not as good as in the situational but better than in the true psychoses, particularly if the situation is removed.

II-B. THE (MORE PREDOMINANTLY) AFFECT REACTION TYPES

Another less frequent group is one in which the affect instead of schizophrenia is the predominant feature. Although a large display of affect may be regarded as one of the striking characteristics of the true prison psychoses, in some of these conditions the display of affect is so overwhelming as to be practically the only presenting feature and thus give us the picture of a pure affect disturbance. It then simulates very closely the affect disturbances such as we see in manic-depressive psychoses, from which, however, it differs in some very essential respects. On the one hand, by the presence of some added features of its own, usually absent in manic-depressive psychoses, it is stamped as a situational reaction; on the other hand, it most often lacks the usual concomitant features of manic-depressive symptomatology. Thus a depression need not necessarily be accom-

panied by corresponding psychomotor retardation, nor an excitement by a flight of ideas. The most frequent syndrome is that of depression with an admixture of anxiety and agitation features. Excitements, if we exclude the psychopathic type, are relatively infrequent.

John Lord's case well illustrates this type of reaction. He is an adult white male, single, age twenty-three, and a baseball player by occupation. His early personal history appears uneventful. Nothing strikingly psychopathic or anti-social is found in his make-up. Claims to have used beer and whiskey in moderation; has been intoxicated several times but never had delirium tremens. Beyond the present imprisonment, has never been in conflict with law. His sexual history appears negative. There is no history of psychosis or emotional upsets in the past.

According to patient's version, while playing in Canada, he visited, in company of some other men in the team, a house of ill fame and there he became infatuated with one of the inmates; his affection was apparently reciprocated. Thinking that she was too good for a place of that sort he told her that if she were ever in any trouble, to write to him. On returning he did receive a letter from her asking him to aid her in returning to the United States. He wrote her to come to his home town, which she did, and he would provide her with necessary funds to her own home. She remained in his city only one day.

During this time he became very friendly with a man who turned out to be a detective. On the basis of the facts of the case, this friend arrested him on a charge of white slavery. It is of interest that the marshal who accompanied the patient, gave practically the same story.

There are no official records available to show the reaction of the patient since confinement or whether he had at any time been delusional or hallucinated. According to the patient's own account soon after he was put in jail, he became much depressed, worried considerably, couldn't eat or sleep, was very sick in the stomach, vomiting nearly everything he ate, and was in a run down physical condition.

When examined by the local physicians, he was pronounced of unsound mind. He claims, however, that, for about a week previous to admission to St. Elizabeths, he was practically in a normal condition.

For several days after admission patient was very depressed and, when questioned about his case, stated he had no idea he was coming to a hospital of this nature and, upon discovering himself here, he became quite worried and depressed, wondering whether he could ever get out of here or not. He gave a clear and coherent account of his past life, but insisted that he was simply trapped by a detective who felt he wanted to make a case of it. Detailed questioning failed to elicit the existence of delusions or hallucinations. Intelligence tests were well responded to. He showed some degree of insight inasmuch as he realized that he was quite depressed while in jail and for some time after. Appeared nervous and fidgety when talking about his case, his lips trembling, face showing fine muscular twitchings and his eyes filled with tears. Frequently talked at length to patients about his case, proving his innocence. After two months stay in the hospital he was discharged as recovered.

Here, then, we have a man whose past history shows nothing abnormal until the time he was arrested on a charge he felt himself entirely guiltless of. He reacted to his confinement with an acute anxiety state and depression, from which, however, he soon recovered. There was at no time any evidence of schizophrenic process or regressive features, the whole condition being quite benign and on the surface.

II-C. THE PSYCHONEUROTIC REACTION TYPES

Although the very onset, course, and outcome of the prison reactions stamp them as being essentially wish-fulfilling in nature, and indeed hysterical features are frequently observed as a part of these reactions, such hysterical features are most often overshadowed and obscured by many other presenting features, largely of a schizophrenic and affect nature. The group "The Psychoneurotic Reaction Types" is here reserved for the rather limited but nevertheless distinct group of prison reactions in which the hysterical or neurasthenic syndrome is outstandingly the most prominent feature of the reaction. Herein are to be found cases of amnesia, mutism, etc.

As an illustration we may take the case of Pierre Leger, a native of France who emigrated to the United States at the age of seventeen. Excepting a brother who was treated for some time in a sanitarium for nervousness, his family history is quite negative. His own history also appears negative for mental illness.

After graduating from high school he worked as a bookkeeper and other occupations and he made a good industrial adjustment. Things seemed to come well along his way until he was about thirty-two years old when, it appeared, he was arrested on a charge of housebreaking and sentenced to eight years imprisonment.

Patient attributes his present illness to the sense of shame in reference to the degradation of having been sentenced for a crime which he denies having committed. At the prison he worried about his condition and his family, lost appetite, suffered with headaches and insomnia, was nervous and could not concentrate his thoughts; says he acted queerly although he was conscious of it; was violent and "if he ever felt that way again he would kill himself." He was in prison only one month when he was transferred to a hospital for insane.

On admission to the hospital he was fully oriented, consciousness was clear and intellectual functions not disturbed. He appeared nervous and sensitive, as one who realizes and feels circumstances keenly. He has at no time manifested delusions or hallucinations but was somewhat prone to magnify his woes and grievances. Family affiliations appear to have had much to do with his unhappiness. His sister married against his wishes. Since his incarceration there have been many deaths among those near and dear to him; his wife has been unfaithful to him and his little child has often been in want of necessities.

Since admission the patient's emotional tone has been variable. At times he seemed elated and cheerful; then again he seemed depressed and in the depths of despair, giving expression to many bodily complaints. At the beginning he complained that he could not sleep at night, that his head pained him considerably, that he was nervous and there was a feeling of pressure on his head. His stomach, too, was out of order and his legs were so stiff that he could hardly walk. He constantly protested his innocence and, when telling of his misfortunes, he frequently gave way to his emotions, becoming lachrymose and somewhat agitated. He was very sensitive; his feelings were easily hurt and he would become excited at the least provocation. At one time, almost a "nervous wreck," he became much depressed and expressed the idea that an unfair advantage was being taken of him because of his nervous condition.

He frequently showed excessive anxiety about his health, any little symptom being sufficient for him to obtain medicine; the least adversity gave him cause for apprehension. From time to time he suffered from various colds and pains, the symptoms of which he would greatly exaggerate; however, he was in good physical health, notwithstanding his complaints. As long as he could be occupied with some light work he got along all right, but close confinement, hard work and worry would soon bring him back to his old trouble, if nothing worse.

He was discharged from the hospital at the expiration of his sentence.

As is usual in all prison reactions, this case showed marked fluctuations of affect, but predominantly we observe here numerous somatic complaints in the manner of a typical neurasthenic; complaints sometimes having slight basis in fact, again, without any such basis and with a constant tendency to exaggerate any adversity or difficulty.

With the approach of the expiration of the sentence, his reactions became much lessened and he was finally discharged from the hospital as recovered.

SUMMARY

1. The enormous and steadily mounting increase in the individual and social cost of crime and the many acute problems it creates make it imperative that its source, nature, and pathology be subjected to a rigid scientific inquiry free from personal bias and social prejudice. Such studies are practically nonexistent to-day, and a perusal of the material at present available, voluminous as it is, makes it quite obvious that the problem of crime, in its individual and social aspects, will not be solved by sociologists, jurists, or statisticians. It is submitted here that its ultimate solution must come from the physician who, through his observation and treatment of psychotics, has more than anyone else had the unique opportunity to study the great variety of human reactions in their pathological manifestations, and who alone, therefore, it would seem, is competent to evaluate the significance of the data present. By throwing light on the nature of antisocial and criminalistic tendencies among the psychotic, on the one hand, and the mental reactions among criminals, on the other hand,

the physician is gradually forcing the recognition that the criminal is basically a diseased personality at the neuropsychic level and that psychoses and criminality, widely different as they appear to be as types of human reactions, have, nevertheless, common origin and background.

2. It is further maintained that these pathological disturbances and personality distortions which lie at the basis as etiological factors of crime are legitimately proper subjects for a scientific inquiry. Amazingly complex as human behavior is, it is entirely preposterous to presume that in its neuropsychic and mental reactions it stands as an exception to the rest of the phenomena in the physical, organic, and animal worlds, and appearing in a chaotic-like and lawless manner is exempted from the working of the principle of cause and effect. On the contrary, there is every reason to believe that events of neuropsychic and mental life show a high degree of integration and stand in definite relation to each other, and are to be regarded both as the effect of a preceding complex of events as well as the cause of events yet to follow. Because of the fact that neuropsychic and mental life is only one aspect of the animal personality which is human, it must be viewed in its complete evolutionary and biological setting, for fundamentally psychopathology is a natural science which deals with a particular phase of the human animal.

3. The human animal is, therefore, regarded as a biological individual whose reactions are fundamentally no different from the reactions of other members on the biological scale, and whose social and mental behavior, therefore, represent one of the many aspects of animal personality. With a background of biological training, supported by careful clinical observations, the physician is coming to view criminality, not as an isolated or incidental phenomenon quite unrelated to the individual's total behavior, but, on the contrary, as a culmination of a long series of psychogenic difficulties that express nothing less than a total life reaction of the individual. It is, therefore, a type of human behavior that has its logical place in the individual's entire mental economy and by expression signifies a specific pathology and distinct distortion in the personality make-up of the individual. Criminality is further viewed as being predominantly a psychic reaction, an expression of a diseased personality at the psychological level: we find no support for the view that physical and intellectual defects, *per se*, condition criminal behavior.

4. It is the immediate purpose of the present contribution to attempt an inquiry in the field of criminal psychopathology by

delimiting first, types of personality make-ups of individual criminals and the specific nature of psychobiologic difficulties that condition and precipitate criminal behavior; and second, to determine the relation existing between the particular type of criminal personality and its reaction toward crime and confinement. Individualization of the problem is emphasized. The approach is essentially a clinical one and the data utilized are those gained from a period of observation extending over six years. As there practically does not exist at present a classification of criminals on the basis of original personality make-up and the nature of pathologic phenomena exhibited, such tentative classification is herewith submitted; and as neither does there exist a classification of the various types of neuropsychic reactions shown by prisoners on and following confinement, a detailed classification of the same is also herewith offered.

5. Intimate psychopathological studies of the life history of many criminals reveal significant distortions in their instinctive and emotional make-up, more specifically relating to difficulties in their psychosexual life; these, in a sense, appear to be quite characteristic for each individual criminal. On the basis of the causal relation that exists between the original personality make-up, the nature of the psychobiologic difficulties that condition and precipitate the criminal reaction, and the reaction to crime and confinement, we may organize criminal reactions into two broad classes, each with several major subdivisions.

6. In the first group, designated as endogenous reaction types in prisoners, we include all those individuals whose criminal activities appear, generally speaking, as direct outcome of some underlying psychogenic difficulties which immediately seem to condition the criminal reaction; when imprisoned these individuals do not, as a rule, show (with the exceptions noted) any significant reaction to confinement. We find in this group the psychotic whose crime is often expressive of unresolved psychogenic difficulties which culminate in a breach of social discipline (The True Psychoses in Prisoners); the psychoneurotic whose criminal activity, usually sexual in nature, is a symbolic equivalent for some socially forbidden sexual craving; the defective, who in his life activities is guided by the more primitive and immediate needs of the organism; and the psychopath whose main difficulties lie in an evident inability to fit into his social environment, but who also carries within himself marked psychosexual burdens.

7. In the second group, designated as exogenous reaction types in prisoners (The True Prison Psychoses: the Situational or

Reactive Psychoses in Prisoners) we include all those individuals, who irrespective of the original cause of crime committed, show, and often, quite soon a highly exaggerated reaction to crime and more particularly to confinement. So intimately is this reaction conditioned upon the immediate situation—the crime and confinement—in which it was precipitated, that its entire content is filled with events of situational moment, while the prognosis too depends quite universally upon the presence or release from the situation in question; hence, by the same token, they are rather superficial in their symptomatology, benign in character and good in their prognosis. As an integral part of the situational symptomatology we find that quite characteristically a large number of cases belonging to this group develop an amnesia for the crime committed or the circumstances that have attended it are so changed as to totally differ from the original situation and thus bear the stamp of a distorted psychotic elaboration rather than of an actual description.

8. This type of reaction may be displayed by any of the above mentioned groups. The psychotic and the psychoneurotic, however, seldom develop reactions to crime and confinement, because, on the one hand, crime to them is a psychological necessity and its commission signifies release of tension; while on the other hand, confinement, that is deprivation or loss of social contact, means less to them than to the normal man by reason of the presence of regressive phantasies and introversion of attention which is so characteristic of them. With greater frequency the situational reactions are observed in the defective and more yet in the psychopath; in both instances because these individuals show exaggerated ego-reaction at the expense of social adaptation. Quite frequently, too, this type of reaction is also observed in individuals whom in every day life we regard as being perfectly normal, perhaps somewhat highstrung and temperamental; people who are often found to be of more than average intelligence and occupying a better social position as well. Their family and personal history is usually without blemish and the present crime is their first serious conflict with law. If we are to relate the personality make-up to the type of crime committed and reaction consequent upon it, we may say that murder is the most frequent crime committed by those in this group and that antedating the crime there is usually found a difficult affective situation in a setting which leads to the commission of the crime under the stress of a great emotional storm and fiery passion. It is not surprising, therefore, that the tremendous amount of affect displayed here is universally characteristic of these reactions, and this to the extent

that it clearly engineers and dominates the psychosis; precipitated in an emotional setting the whole reaction appears predominantly as an affect disturbance which colors its entire symptomatology.

9. Because the situational reactions have received but scant attention at the hands of psychopathologists, while the existing terminology is not only confusing and conflicting, but clinically incorrect as well, an attempt is made here to offer in terms commonly accepted in current psychiatry a classification based on a more or less intimate study of criminal insane as found in St. Elizabeths Hospital. Under the general heading of the True Prison Psychoses we offer to include three major subdivisions.

A. THE MORE PREDOMINANTLY SCHIZOPHRENIC REACTION TYPES

Although affect disturbance is regarded by us as forming the distinctive feature of True Prison Psychoses, in a large number of these, a distinct schizophrenic trend is often observed which may even obscure the fundamental emotional background of the reaction. Herein we class the following groups:

1. Malingering reactions, including malingering psychoses which we feel we are justified in regarding as a distinct clinical entity.

2. The situational psychoses proper. This includes such reactions as acute panics, paranoid states, confusional and catatonic reactions, etc.

3. Regressive prison psychoses. These are psychoses which, although having all the earmarks of a reaction to the environment, have, nevertheless, much in their symptomatology that is of a regressive nature, by reason of which they bear a large resemblance to the endogenous reactions such as dementia precox. It is particularly this type of reaction that was formerly often classed under the heading of Degenerative Prison Psychoses.

B. THE (MORE PREDOMINANTLY) AFFECT REACTION TYPES

In this group the display of affect is so overwhelming as to be practically the only presenting feature and thus give us so close a picture of a pure affect disturbance as to simulate the manic-depressive psychoses from which, however, it differs in some very fundamental respects.

C. THE PSYCHONEUROTIC REACTION TYPES

These are situational reactions which employ for their manifestation hysterical or neurasthenic mechanisms, such as amnesia, mutism, etc.

POSTENCEPHALITIC RESPIRATORY DISORDERS
REVIEW OF THE SYNDROMY, CASE REPORTS AND DISCUSSION

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PSYCHOPATHOLOGICAL CONSIDERATIONS

When one seriously gives himself to the reflection that the human organism, as an energy system, has been a billion years in the making, no one but a consummate ass could believe himself capable of understanding but the most insignificant part of this whole magnificent evolutionary product. One can quite sympathize with Fabre, that brilliant genius who has done so much in the study of insects, who has said that he had turned over only a grain of sand upon the beach of the insect world and hence did not pretend to comprehend the whole ocean. Whereas, perhaps, it would smack of an excessive affectation to be so humble with reference to our own communication, nevertheless we know that the material here offered is but a grain of sand in the whole structure. Or to change the metaphor, "since our knowledge is no more than a scratch upon the solid mass of our ignorance, we cannot profitably dispense with any instrument or kind of method."¹

As one notes the behavior of these patients with respiratory anomalies; reads the reports of others concerning the same; endeavors to include other features of apparently important significance in the general picture; and would boil down or concentrate the entire situation, and rashly make an effort to generalize, at least two avenues of approach seem to offer some help to one of the goals of all such enterprises, *i.e.*, the goal of therapy.

Given two such patients, as already outlined in our paradigmata, how is one as a practicing physician, to proceed to bring about an amelioration of the situation, the which is the only question, which concerns the patient, and his entourage? From what vantage point is the desired result to be brought about? Since good theory lies at the basis, fundamentally, of good practice, which avenue of approach seems to offer the most? Our own reflections lead us to believe that looking backwards from the highest vantage ground of the latest

¹ Donley, J. E. What Young Physicians May Learn from Hughlings Jackson. Rhode Island Med. Jl., Nov., 1924.

evolutionary products is more likely to offer one the opportunity to see the whole situation, rather than looking forward from the beginnings of things towards the final summation, realizing that both issues have a common meeting point. Hence in our searching for a resolution of points (5, 6, 7) we choose to pitch upon those conceptions which deal with ascertainable data concerning the *purpose* reached for by the *behavior* in question. It is fully realized that such a search for *purpose*, behind the behavior is not by any means any less difficult to summarize, than the means, or structural-functional (anatomical-physiological) correlates. Yet this, for the time being, is postulated as desirable.

Inasmuch as *function*, phyletically speaking, has gradually built up *structure*, we turn our attention to those fundamental mnemonic precipitates which biology has termed the *instincts*, as automatically working *purposes*. Of these, disregarding the later evolving *habits*, termed "instincts" (we think incorrectly) by some serious students of these problems, what light can be shed upon our problem by a study of these instinctive reactions which practically all biological students have agreed as fundamental in all life processes, *i.e.*, *Reproduction* and *Subsistence*, *i.e.*, the Sexual and the Self-Preservation Instincts. Without the former evolution is unthinkable. The latter is a correlate and in a sense a dependent. Thus one turns to conceptions of comparatively recent formulation concerning man's mental systems in an effort to learn somewhat of *purpose*. By "purpose" we are not here speaking of what emerges in conscious processes only; we mean by it patterns elaborated for the attainment of definite goals. In a sense here by "purpose" is thought of as something similar to the conceptions of entelechy, not the least interesting of which are those of Driesch. The older psychological schemes cannot be dismissed summarily, as for instance is attempted by the Behaviorist, or by that movement in psychology known as Phenomenalism, nor even by the Gestalt or Configural psychology, important as some of its conceptions undoubtedly are and promise even more to be. In the broad sense a *genetic psychology* appeals. It may be claimed as a viewpoint by all of those here cited. Inasmuch as the Freudian psychology, speaking in the large, alone³ has really come to grips with "pathological" behavior, its principles make a special appeal in studying the material under consideration. In

³ We are not unmindful of Gelb and Goldstein's studies by means of the Gestalt conceptions, but as yet this field has been cultivated but slightly in pathology. Psychologische Analysen hirnpathologische Fälle. Psycholog. Forschung., 6, 1924, Heft. 1, 2.

another place⁴ I have discussed specifically Hauptmann's⁵ contribution to this problem, especially as it applies to the behavior of the encephalitic, particularly directed to the loss of, or lack of initiative seen in so many of these patients, including those showing regression to the "respiratory level," in other words, those here discussed.

It is difficult to decide just where to break ground in discussing this respiratory behavior from the psychopathological point of view. The field is practically a virgin one. In stating this one is not unmindful of the fact that a vast and important series of studies is available concerning anomalous respiratory behavior. We leave to one side that part of the field in which lung, heart, kidney, thyroid pathology is of moment⁶ and deal with respiratory disturbances of manifest neuropsychiatric importance. In the special field which has been separated, the rubric of "hysteria" looms large in nosology. Weir Mitchell's study has been cited as an indication of this material of an earlier vintage. How to put it in new bottles is a part of our problem. In fact even those collections of rare vintages had their earlier cultures to which a study of Garrison's charming "History" offers orientation. To avoid, however, a historical series of reminiscences which might even include Laehr's classical collection, it seems more desirable for practical purposes to wave them all aside and come to the present era of formulation instead of laboriously weaving in and out of the historical perspective.

In Freud's far reaching conceptions, embodied chiefly in his study of "Das Ich und das Es," if here comprehended aright, the *mental systems* of the adult human being may be conceived of as roughly partitioned into (1) a fundamental group of mnemonic accumulations,⁷ the "Id" as he would call it, which functions as a whole, for the phyletic instinctive urges of race continuation and personal subsistence. Life wishes, or purposes, or patterns, are here automatically represented. Death wishes, or purposes, or patterns, are also there present. (2) A second mental system has evolved, a Das Ich—an "Ego" which is less automatic, less of a reflex automatism, hence more plastic in its functioning, and more in contact with consciousness and immediate reality from without than the older unconscious mnemonic bindings of the Id. From the genetic point of view both

⁴ Jelliffe, S. E. Schizophrenia and Epidemic Encephalitis. Their Alliances, Differences and a Point of View: Research Association of Nervous and Mental Disease. Dec., 1925. Awaiting publication, Am. Jl. Psychiatry, Jan., 1927.

⁵ Hauptmann, A. Der "Mangel an Antrieb" von innen gesehen. Arch. f. Psych., 66, 1922, 615.

⁶ See Hoover, C. F. Bedside Study of Air Hunger. J. A. M. A., 87, 1926, 813, for recent general orientation in this somatic field.

⁷ We here follow Semon's general conceptions.

of these mental systems are directed for the most part towards reality. That part, the Id, at least has had a billion years experience with reality and knows how to handle it automatically, and if not prevented, advantageously.

The human organism must handle reality *stimuli* from *without*, as well as *instinct* stimuli from *within*. It must master both. It must either *adapt* itself to the outer stimuli or *abolish* them by some procedure. In the former case the psychophysiological system must make an *autoplastic* type of adaptation (modify itself) or it may be by an *alloplastic* procedure (modify the stimulus), abolish the particular source of stimulus from reality. In the case of mastering instincts, the same procedures or mechanisms operate in health as well as in disease, at biological as well as at social levels. Thus when an animal develops hair to meet the cold stimulus of winter, an *autoplastic* mechanism is at work at a biological level. If at a social level the human being puts a furnace in his house to meet the same cold stimulus, he operates *alloplastically*.

As has been pointed out by Freud and others this alloplastic mode of behavior is chiefly a social attainment; biologically the autoplastic processes are more in evidence. Thus in the mastery of the sexual instinct stimuli from within (whether hormonal, reflex or symbolic) the immature personality has recourse to autoerotic autoplastic gratifications; the adult mature personality seeks external objects—biologically heterosexual, and socially, exogamous and marital. On the side of subsistence, biological autoplastic processes have developed limbs, teeth and alimentary organs; socially, weapons, agriculture, cooking, refrigerators and tinned foods have been developed alloplastically. As Alexander⁸ has well expressed it “the reproductive instinct has in part, in association with the self-preservation instinct, adopted this autoplastic moulding of the body apparatus, together with alloplastic modifications through civilization, by creating new objects.” The *libido component* can be found in every product of civilization as in every part of the bodily apparatus. The point of chief interest is to preserve a tension equilibrium in the mastery of external stimuli and of internal instinct stimuli. This the mental systems accomplish through these alloplastic and autoplastic procedures, either modifying reality to suit its own purposes or unable to withstand the pressure of reality, it adapts by altering itself. Reality comes from without and from within.

It will be shown, inasmuch as disease processes in general, and in

⁸ Alexander, F. A Metapsychological Description of the Process of Cure. Int. J. Psa., 6, 1925, 13, a translation from Int. Zeit. f. Psa., 11, 1925, No. 1.

particular the one with which this thesis is concerned, brings about in large measure regression or dissolution of function to earlier stages of organization, that the ontogenesis of the libido situation is of paramount importance if the behavior of these encephalitic cases is to be partly understood and specially the respiratory behavior. Thus in the developmental stages of the libido organization there comes about a replacement of an intrapsychical narcissistic object by extrapsychical objects. An autoerotic libido discharge takes place by genital activities towards objects. In a neurosis, considered as such, there is a protest against the culturally arrived at alloplastic stages of development. Thus neurotic behavior, as a fragment of the respiratory picture in the focus of attention may advantageously be seen in a similar light. A neurotic symptom may be envisaged as an unsuccessful effort at adaptation as Freud has emphasized, and, in the frame here constructed, an attempt at "autoplastic mastery of instinct." Just how this works out in the respiratory phenomena we shall hope to suggest.

But one is not finished with the theoretical considerations. When the mastery of instinct stimuli is only partly successful, the tension is not entirely relieved. The deepest layers of the personality—the Id—may be somewhat freed, its entelechy partly expressed, but a later system, the Ego, must take up the task. Here the "feeling of illness" in consciousness is a register of this transfer of tension. Again to lean on Alexander's phrasing of the situation, "the conscious ego has already reached the mature stage of exogamous, genital object-libido; it has prepared itself for activities towards sublimated patterns; the symptom on the other hand consists in an autoplastic modification, in a substitution of incestuous, introjected objects for exogamous objects, and, in the psychoneuroses, considered as such, only in *hysteria* is a genital form, substituted for a *pregenital* form.

These *pregenital substitutions* are of especial importance in our inquiry and will occupy our attention later. It may only be emphasized at this point, how totally inadequate and misleading—if not nonsensical—in certain cases, have been the conceptions that would speak of the various forms of encephalitic behavior as "hysterical," "pithiatic," "hysteriform," etc. Such belong to the baby language of science relative to the psychoneuroses.

To resume the theory; the attempted autoplastic substitutions which by regression would try to master the instinctive pattern (entelechy) discharges gives rise to the *feeling of illness* as a repudiation of the actual symptom formation. To anticipate, in practice,

the obscene language in our Case I when under Dr. Burr's care, and nosologically classified by him as "degeneracy," is conceivable as an autoplasmic regressive phenomenon, in which oral-erotism and anal-erotism would take the place of (*i.e.*, be substituted for) genital interests. To anyone at all acquainted with ancient customs as recorded in the story of Lot, and Sodom and Gomorrha, or as later chronicled by Petronius in his *Satyricon*, the socially evolving aversions to such displacements of genital interests, can be envisaged in a new light. The *actual symptom*, "sodomistic behavior," is repudiated by our patient. The outlet for his regressively felt anal-tension consisted in "obscene language" oral behavior.

In order that "such things may not be," for even the sickest patients prefer an absolute flight from reality even into a psychosis, the fight between the ego and the id—as the two mental systems may be envisaged—goes on.

In the earlier formulations of psychoanalysis one reads much of frustration, of disappointment, and of trauma. Certainly in encephalitis, one finds a trauma much greater than that conceived of by Freud in the early days of his investigations. Here is a trauma almost the equivalent of that of paresis, which has been most suggestively studied by Hollós and Ferenczi.⁹ This trauma of encephalitis goes much further than most "traumatic neuroses" producing traumata—but does it change the mechanisms? Practically all the neuroses may be interpreted from a traumatic basis, in so far as trauma, in its largest sense, means encounter with reality, and what is termed *constitution* may be conceived of as but another term for *phyletic experience*, whereas *disposition* may be envisaged as *ontogenetic experience*, of trauma (stimulus) reality.

With "constitution," as thus conceived, here there is no concern. It is left for the students of heredity problems and interests us chiefly in prognosis. With "disposition" there is much concern, especially since imitation plays such a large rôle in the matter of determining just what environmental patterns the individual has had in his mastery of reality, from without as well as from within. Very frequently one has but to carefully watch parents to understand why the patients are fixated in certain reactions. As a result of the trauma, regression takes place, and attempts to stop at certain fixation points in the individual development are more or less successful. Freud's principle of the "repetition compulsion" here becomes illuminated, for the patients repeat "movements" muscular, visceral,

⁹ Hollós and Ferenczi. Psychoanalysis and the Psychic Disorder of Paresis. Monograph Series, No. 42.

lingual, etc., which are of autoplasmic service, at a given fixation point, for relief of the tension of their instinctive cravings. The "repetition compulsion" is the result of a tendency to discharge either in the mastery of the external stimulus or of the instinctive drive. In the former case some motor activity calculated to modify the stimulus, or change the body itself results. Reflex innervations, automatically operate in the first case for standard stimuli. Any mechanism therefore which has been of service in the past may be seized upon like a compulsion—an echolalia, palilalia, sialorrhea, diarrhea. Possibly even the paroxysmal tachypnea of the respiratory cases contain as an element a release at an early level. Whether to external or internal stimuli, or both, only individual study can show which effort at mastery preponderates in the repetitive act. In so far as histopathological study has shown that great trauma is inflicted upon the vegetative mechanisms of the thalamic and striatal levels, it is not unreasonable to argue that the task of mastering instinct stimuli is greatly interfered with and that the relief activities found should show repetition features at earlier, *i.e.*, phylogenetically (decerebrate, bulbar, spinal, even peripheral sympathetic), levels of functioning.

The various stages of organization of these instinct activities are very incompletely worked out for the nutritive or metabolic activities. As already indicated the work of Dresel, Lewy, Laignel-Lavastine, Pende, L. R. Müller and others supply a great fund of information concerning various stages of metabolic organization activities. It is not feasible to enter into a long discussion of transformation stages of chemical organization. Hence we jump at once to the oxidative hormone function as one of the earliest fixation periods where, to paraphrase Descartes, "Cogito ergo sum," one might say "I breathe ergo I survive." Instinct mastery of the self-preservation principle consisted in this organized reflex activity. "Back to the lungs" could be the cry of the organism threatened with extinction in a topsy turvy vegetative nervous system trauma¹⁰—not overwhelming enough to cause death, but sufficient to disorganize the orderly schedule or pattern of automatic metabolic adaptation. As stated, from the standpoint of the mental systems formulation, the Id pays attention to these phyletic mnemonic patterns, and said formulation constitutes the *mental aspect of the precipitate of these instinctive situations*. As one, at one time somewhat immersed in biochemical problems, no more fascinating research can be imagined than to enter

¹⁰ See Pierre Marie's interesting comparison to schrapnel-like trauma of the encephalitic virus in his Introduction of Gabrielle Lévy's thesis (*l.c.*).

into the study of the stages in organization of metabolic complexity. Possibly such a conception is an illusion of the systematizing "personality type." As mankind lives by his illusions, at least so great a genius as Ibsen has claimed it, let it rest at that.

At all events certain investigators have shown that the "fiction" (Vaihinger) of "organization" in the field of the genesic instinct has yielded important conceptions for understanding human behavior and principally, the psychoanalytic tool of investigation, from the standpoint of regression and fixation, elucidates many a bit of behavior incomprehensible from any other point of view. These stages of organization are too well documented to need any extensive recital here. Every step in the process is still under investigation, but certain broad platforms emerge. These are: the intrauterine phase (broadly surveyed in Rank's "Trauma of Birth"), the various autoerotic (organerotic)—polymorphous perverse phases, pregenital and genital, chiefly outlined by Freud in his Three Contributions, the Œdipus phase of Freud, the genital supremacy phases, finally culminating in the socially matured development of a *heterosexual, exogamous, sublimated family phase*, ideally phrased as civilized, cultured, socialized, with its millions of patterns of discharge for creative tension.

If by reason of frustration, disappointment or trauma, or other cause or causes, the individual is unable to discharge his energy at the highest social levels, according to the conception of regression in psychoanalysis, or of dissolution of function in Hughlings Jackson's terminology, he falls back upon early stages of fixations and by autoplasmic or alloplasmic modifications attempts an adjustment. The libido, using this concept, utilizes what it can. The resulting behavior is complex but challenges interpretation.

Inasmuch as no effort is here even thought of to attempt to envisage the entire symptomatology, but only to try to scratch the surface of our ignorance of the respiratory behavior, attention may be directed to obtained data practically as yet in a virgin field. After presenting some of this material gathered by the analytic method of study, a return to the theoretical situation is contemplated.

Much as one would like to line up the data, with the theoretical postulates here briefly sketched, this is impossible. The collector of fossils does not find them all carefully arranged as in the museum, any more than the botanist finds his plants on the hillside classified according to the manuals of Engler and Prantl, Bentham and Hooker, of Gray, or Britton and Brown, etc. He gathers what he finds and arranges them in their natural order as best he may later.

Thus for the data in psychopathology attention is first directed to Case I here cited in detail as to the clinical history and phenomenology.

Case I was brought for treatment by a most alert, intelligent, and hopeful brother. This is emphasized because without this brother's most persistent and conscientious efforts the results obtained in therapy might have been nil. The brother had been a reporter on one of the New York dailies which in a sense had made him "acquainted with human beings"; he was no academically trained psychologist.

During the first week of our contact—three interviews—attention was directed to the patient's story and to a neurological examination. His dreams were requested but they were not discussed. It need not be unduly emphasized here the rôle that dream-analysis plays in the general psychoanalytic situation. Nor are we interested, at this point, with the criticisms directed towards the possible fallacies of the method.

The first dream which seemed to offer a profitable opening for the analysis was as follows:

OCTOBER 29, 1924.

Last nite I dreamt I played hookey at C. High School. I had two difficult written lesson to hand in that day. I had them done partly (not efficiently). I did not like to go to school with my work done in a half-assed manner. I was in a candy store about two squares from the school. Incidentally I had already gone to school, hung my winter overcoat and felt hat in my locker at school. At the candy store I met a very dear pal o' mine—J. L. I told him I wanted to "bag." He replied, "I can take the day off without playing hookey, why don't you do the same?" I told I would but I was afraid I'd get hell from my folks. I also dreamt that I sent J. to school for my coat and hat. I told him to put the coat over his spring coat and bring it to the candy store and we would go to Philadelphia.

No detailed analysis was made of this first dream, although the pleasure-serving nature of the illness was apparent. Its even superficial survey reveals some regressive factors which are of value in view of the theoretical outlines here given.

The discussion regarding *playing hookey* brought up his not infrequent practice of playing hookey from school, loafing in court rooms, and certain curiosities regarding criminal acts. It also led to a discussion of his compulsion to stay in bed in the morning, or all day, and the fights with his father and brother to get him out of bed. The

technic of the male members of the family in handling this staying in bed, a very constant symptom in this type of case, was the usual one of hectoring and badgering. It was the "spare the rod and spoil the child" kind of firmness. This had been the routine when he was on the "farm" under "treatment" and many of his most violent, almost katatonic, tantrums had come from the negativistic refusals to get up when the "nurse" would pull the covers off his bed and even throw cold water on him. All of this type of thing was of no avail. I had to tell the father in decided terms to "leave the boy alone." "Treat him as if he did not exist and the results would be better." At first the father could not occasionally resist the temptation to use forceful methods, but so pronounced was the opposition and stubborn behavior on the part of the patient each time he attempted it that he soon saw it was a destructive rather than a constructive method and he left the boy much to himself. This regression to a sadistic anal-erotic "obstinacy" characterized both Case I and Case II. It was extremely marked in Case II, who for a year or more rarely would get out of bed before the afternoon or just before the dinner hour.

In Case II where for a period of nearly three months I had opportunity to note daily this "staying in bed" symptom, all I could learn, from the conscious side, was that she was so "tired" she could not get up. Here the "lack of impulse," "Mangel an Antrieb," much discussed by Schilder and Hauptmann, was rationalized as "she was so tired" as she had been awake all night with heavy breathing. This so-called lack of impulse is but a surface indication and, as in the compulsive neurotic, there is an *increase* of impulse in the direction towards the death wish but held under repression, hence unexpressed, save through some ceremonial, *i.e.*, symptom.

Further discussion of the dream in Case I brought out the difficulties he had had at school after his delirium and after the summer vacation when he tried to go back to school. Further dream analyses were quite definite in establishing a "transference." The details are omitted here since they deal with the general situations of psychoanalytic technic which have no particular relevancy in this communication.

Attention may be called to a very interesting dream of January 7, 1925, in which the Oedipus situation was brought up.

"I was with another fellow—he lives here in New York (my old friend Jerry). First he said let's go to a \$1.00 house. No, I said let's go to a cheaper one, a 50 ct. one. So we went. At the door there was a peculiar device to open the turnstile type of door; a

device like a dial telephone disc, yet it was vase shape in general proportions. We turned it, a bell rang and then we entered by a side entrance. The madame of the house was my aunt, and there were two girls in their undergarments, two beds. Jerry was all there as he took the lefthand girl. It took him some minutes and he puffed and grunted and everything (just like I do). I did not do anything. We paid our 50 cents and got out."

For anyone who has had but slight analytic experience, *i.e.*, one who has not read about it only in books, but has actually tried to analyze a patient, this dream scarcely needs any extended discussion. Its main features are quite explicit. First one sees the splitting of the patient into *himself* and *Jerry* which is a frequent dream device indicating different aspects of adaptation to reality (here inner, instinctive [libido] drive). Previous analyses, as well as association material with this dream, reveals "*Jerry*" as his inferior, *i.e.*, regressive immature, infantile and adolescent (narcissistic introjection) split off, sexuality. It was by *Jerry* that, from 12 to 13 years of age, he was first initiated into the pleasures of mutual masturbation. *Jerry* also had in these early experiences made sodomistic advances and encouragement (pregenital anal-erotic organization stage). The patient states these did not interest him consciously but efforts at seduction of little girls through *Jerry's* leadership was much in evidence after twelve. The \$1.00 and the \$.50 detail are, I take it, as expressing both the (1) adolescent and (5) finger (handling, feeling the genitals) method of seeking the female. *Jerry*, as more proficient in the art of seduction, is the sponsor for the former, *i.e.*, \$1.00, the 100 per cent (coitus) pleasures.

The "door" device could not be analyzed further, indicating juvenile efforts at phallic and finger seduction. The "madam" of the house was his aunt, the *mother's sister*. She resembles the mother very closely and the identification is evident and throws light upon the Oedipus phase.

The significance of the psychological motivation of the "breathing attack" is quite clear as to some of its components. It is a forbidden activity carried out in a substitute, *i.e.*, a regression to an autoplasmic mechanism, a fixated mechanism at the respiratory level.

Asked why in the dream he himself did not go through with it, he said, "*Jerry* took the prettiest girl. I did not like the other girl's looks."

Q. What was wrong? A. "Oh, I don't know—I guess I was sore he took the pretty one."

Q. Yes. A. "The other one had bandy legs."

Q. And. A. "They reminded me of someone—I don't know—oh, yes, my uncle has legs just like that! He's my father's brother. Oh—that's funny! Is that father? What does that mean?"

It is possible therefore that the *father prohibition* entered into the inhibition in the dream. The male aspect of the Oedipus situation.

It may not be too hazardous also to state here that a part of the psychodynamics of the salivation represents what it is known to represent in many schizophrenics, *i.e.*, an orgasm. "Jerry had an orgasm in the dream." The patient only envied him, *i.e.*, "his mouth watered." It may be mentioned that when the patient is in a trance state "his mouth waters," *i.e.*, he salivates. Salivation in trance states, chiefly apneic periods, was frequent in Case II as well.

A more detailed study of the mouth movements may be entered into later, where it is clear that oral-eroticism as a regressive stage to the nursing period, is another factor in the salivation behavior. In Case II this is certainly evident wherein finger-sucking still persists at the age of twenty-seven.

Dream of January 16, 1925, Case I: *Horrible Dream: Dog was biting my damned hand. He was panting like the devil. I could not shake him off—(left hand).*

It has already been indicated that in Case I panting frequently terminates in a trance state with salivation, and cyanosis, as well as a secondary set of phenomena due to the pulmonary hyperventilation, *i.e.*, tetaniform cramp states. The trance states may or may not be so synthesized, for the patient frequently had trance states independent of the hyperventilation phenomena. Apnea was almost always concomitant with the trance states, also at times the breathing halted, or was micropneic, and trance states supervened. It seems, therefore, reasonable to recognize trance states independent of the hyperventilation biochemical consequences—acidosis, etc., and trance states even independent of breathing anomalies.

In the "Jerry dream" as well as in this dream of January 16 the "panting" breathing was recognized readily by the patient as of the type which was frequent with him. In the "Jerry dream" it was Jerry that "panted." In this dream of January 16, the patient himself panted. The coitus equivalent has been indicated in the "Jerry dream" and psychoanalytically it is not difficult to glimpse the Oedipus situation. The "madam" of the house is but a thin disguise for the mother. The inhibition or censorship that prevented his own participation, *i.e.*, consciously recognizable as himself as performing the coitus, can well be conceived to be the father

prohibition, more ingeniously disguised behind the "bandy legs." Whereas it may be difficult, even seem absurd, for the scholastic Aristotelian to make this identification, one is not interested here in the conscious logic taught in colleges. Even though it may be shown that in algebra such substitutions are not objected to, for x may have any value that solves the problem. Thus the girl's legs as x , =bandy legs = Father = prohibition, is quite consistent with dream logic as with algebra.

In the analysis of Case I it was never possible to revive any memory of actual observation of panting during coitus on the part of the parents. The opportunities were not lacking however as the general history had revealed. This situation however has been amply covered in the general literature.

In the dream of January 16, the "panting" was evidently of a different stage of behavioristic reaction. It was more in relation to the masturbatory complex. All the setting is there, the regressive libido (dog), the offending member (hand), the threat (probably castration) (biting). Needless to say the patient's whole conception, in consciousness, of the act of masturbation came under discussion. It was the usual one of fear of "ruining his life"—compulsion to perform, remorse and regret, etc. It is not necessary to detail the therapeutic elucidation of the significance of masturbation in the genital organization. All that is necessary here to point out is the participation, as of substitute reaction of the masturbatory act in the breathing episode.

As already noted Runge came to a similar interpretation in his patient, although, and this is possibly worth emphasizing, his conclusion was reached by the hypnotic rather than the psychoanalytic technic. Furthermore we might venture here to show, were it important enough, that Runge's patient's breathing also incorporated higher genital organization phases as well.

Following the analysis of this dream of January 16, Case I was able, he said, to read a book of 300 pages. This was the first time since his illness he had been able to concentrate long enough to go through a book.

Following the botany metaphor of collecting our specimens as we find them, independent of their systematic alliances, a later dream may be cited. It is of interest from a number of points of view. From the standpoint of the dynamics of resistance it offers interesting material bearing upon theory, since "resistance," "fixation" at earlier psychosexual organization stages, and the "repetition com-

pulsion" as a discharge mechanism, are all bracketed in the same frame; and secondly—although somewhat outside the main thesis, *i.e.*, the "breathing repetition compulsion," it may throw light upon a bit of muscle behavior which is one of the most frequent of the phenomena of Parkinsonism—*i.e.*, the "tremor."

March 10, 1925. *I dreamt Jerry and I were waiting for a train. A cop bumped into Jerry. Jerry hit the cop. The officer grabs Jerry. I stick up for Jerry. The cop (a great big blonde six-footer) grabs me too—by the collar. I cry like a baby. Jerry cries too. He walks us for a while and then takes us into an old shack. In the shack is an old dirty room. In the room next to it is a young Italian woman. (While the cop is holding me and taking me to the "shack, I am threatening him.") Meanwhile the cop goes to make a phone call in the shack. When he goes I say to Jerry, "Let's beat it." Jerry hesitates for a moment, then agrees. We run into the yard and hide behind a snow bank. At this stage of the dream I wake up.*

I am the "cop" (American jargon for policeman—gendarme). (I am 5 ft., 10 in. in height, blonde, and weigh nearly 200 pounds, *i.e.*, "a great big blonde six-footer.") "Jerry" here again functions as the split off, lower stage of libidinous fixation. Here is a conflict, as in the case of the choice of girls in the brothel in an earlier dream. The transference-resistance phase is clearly indicated. The analyst is a little too strong for him—protestingly both are carried back into an earlier phase of the libido situation—the Italian phase—lower phase. *Young Italian woman* (by association, refers to coveted illicit amorous adventures; Jerry knew a "dandy dago girl" who was quite ready for the asking).

Here one sees the effort to shake off the father (prohibition), the "cop" and to "beat it," *i.e.*, to regress to the phantasy of illicit amorousness. Behind the "snow bank," behind the "mother." In order to get away from father, the child hides behind the mother. In regression retreats to the mother.

These are some of the general outlying features of the dream but the situation to which attention is now specifically directed comes out when one scans the dream *as it was written out* by the patient, and here reproduced. Particular attention is called to the line in the written copy of the dream where the patient (regressive libido situation) in custody of the prohibiting father, *i.e.*, the Super-Ego censorship (*while the cop is holding me and taking me to the shack, I AM THREATENING HIM*) here the parkinsonian tremor appears most strikingly. Thus (see next page):

It might seem that this *tremor* situation were dragged in, but as it regularly appears in nearly every respiratory case which I have observed, it seems to bear a close relationship to the whole "purposeful" (unconscious) substitutive regressive 'autoplastic indulgence of the patients' libidinal discharge, and in the nature of some *fear* lest they be detected in this maneuver. No one needs to be reminded of the close relationship between fear and tremor. Animals and man have "shaken like an aspen leaf" ever since human records of fear states have been made. The various layers of this reaction will probably be analyzed with profit for centuries to come. One need but

Monday Morning Dreamt Last Nite

I dreamt Jerry & I were waiting for a train. A cop bumped into Jerry. Jerry hit the cop. The officer grabs Jerry. I stick up for Jerry. The cop (a great big blonde sup-hotter) grabs me too—but the collar I cry like a baby. Jerry cries too. He walks us for a while and then takes us into a shack. In the shack is an old dirty room. In the room is an old Italian couple. In the room next

to it is a young Italian women [While the cop is holding me & taking me to the shacks, I am threatening him] Meanwhile the cop goes to make a phone call in the shack When he goes I say to Jerry "Let's beat it" Jerry hesitates for a moment then agrees. We run into the yard I hide behind a snow bank. At this stage of the dream I waked up.

[Brackets ours.]

cite Stanley Hall's "Synthetic Genetic Study of Fear."¹¹ Here our interest is limited more closely to a level indicative of the conflict of the individual in his regressive indulgence of some phase of his genital organization less culturally permissible than the Ego-ideal registers; or maybe one that biologically is inimical to his creative goal, or, even at the level of the Id—something possibly destructive to his life (death wish-suicide component). Were we slavish followers of Stekel's conception—the "snow bank" might be significant of the "death wish." Again the "snow bank" is known to symbolize the mother's breasts, and here again a component of "salivation" appears.

In the delirium at the onset of the encephalitis in Case I it may be recalled that the patient saw "angels." It was possible to reconstruct a part of this delirious-regression image, but only a fragment. These

¹¹ Am. Jl. Psychology.

"angels" were dimly reminiscent of something connected with his childhood—beyond this, any recall of infantile memories was unattainable. Psychoanalytic workers know many reasons why. It was learned, however, through the brother's inquiries, that these "angels" were replicas of wood bas-reliefs on the back of a sofa upon which the mother of the patient frequently sat when she nursed him, and this, quite into his second year. It has disappeared from the family's possession since the patient was four to five years of age. At this point it will be recalled also that Case II was a persistent nurser, and further a "finger sucker" up to the present time (twenty-seven years). That her "drooling" should be a prominent symptom seems not illogical as a persistent autoplasic regression to oral-erotic gratification discharge.

The Apneic Phase: Consideration of the end to be attained in the respiratory cycle would be incomplete without some attempt at an understanding of this phase of the phenomena in question. Although but few of the studies already given in abstract indicate that a regular respiratory cycle is the rule, personal observations of many cases seen cursorily, and careful observation over many months in the two here reported, are clearly indicative that the respiratory behavior can go through a fairly regular cycle. It begins, mounts, continues for varying periods, and finally ends in an apneic phase with trance states, or yawnings or cyanosis or other type of climax. In short the behavior, respiratorially expressed, seeks some end—a tension discharge of some sort. To say that the patient is "fatigued" is not at all an adequate summation of the situation.

In Case I this whole cycle was very definite. It was a series of clear-cut cameos. In Case II it was less so. The pneumographic tracings show this. Disregarding the vastly more numerous incomplete cycles, a typical cycle ended invariably in a state of partially obscured consciousness. These have been described in many instances by many observers as trance states, unconsciousness, epileptiform, narcolepsy, etc., etc. The feature to be emphasized is the *climax to be reached*, whether in yawning, mouth grimaces, tics, shivers, mild convulsive attacks, trances, or what not. In practically all of the reported cases, sufficiently detailed to be of service in this portrayal, salivation, with cyanosis with or without antecedent facial suffusion is discernible. Expressed in conscious terms of purpose, the patient is after something, and gets it—completely or incompletely. As already stated for Case II, the deeper the "yawn," the greater the release of tension, and the greater free interval before the new necessity to meet the stimuli from without or those from within by

a repetition of the breathing behavior. The "yawn" at the sensori-motor or physico-chemical levels is not our concern at this moment. We know quite well that yawning and stretching have oxidative functions and that sleep is not a negative of being awake and a passive state, but is a purposefully sought active process for anabolic requirements, as well as relief from meeting stimuli from without and turning on an old method of handling stimuli from within (dream work).

In other words the greater number of these attacks carefully studied showed "compulsion activity." The data are not available in the many reports here abstracted to permit or to contradict such a generalization as invariable.

The conception is here put forth that such compulsive reaching for a stage of adjustment, and its resultant tension relief, may be said to be accomplished at many levels of psychosexual organization. As already indicated, from dream evidence, see Case I, already cited, a respiratory cycle may, like a major hysterical crisis, accomplish a coitus substitutive relief. Case II showed similar relief situations as will be reported.

These were discharges of tension at levels of genital organization, nearly always involving, however, taboo components in the Oedipus sense. The whole thing had to be camouflaged because the object was not intrinsically exogamous and hence socially permissible. Father or mother as Case II and Case I respectively show.

In the majority of attacks, however, the phase attained was narcissistic, *i.e.*, masturbatory in the general sense, often with homosexual factors. Case II showed the homosexual regressive fixation stages very persistently in the dream material, although entirely foreign to consciousness. Here, however, a pronounced unconscious brother-fixation was the index of the homosexual (narcissistic identification) situation.

The observations here specified are not isolated ones as may be seen from the very few facts offered by Witzel relative to his Cases II, III, IV. Thus in Case II, the free association technic (dreams are not recorded by Witzel) brought out the facts of early exhibitionistic traumata and attempted genital manipulation by older boys when the patient was eleven years old. A cousin of hers in masturbatory activity with her had dyspnea like the patient's and this cousin was identified with the father. Witnessing the sexual act of the parents brought on difficult breathing and the memory of her wishing to take her mother's place was evoked in the analysis.

Also in Case III of the same author there were early exhibition-

istic traumata. This time it was urination on the part of older boys. This was followed by an assault when she had great respiratory reactions. After her encephalitis the thought of the phallus induced the breathing—even the sight of a male was sufficient external stimulus to set off the repressed traumatic event. Similarly in Case IV of Witzel's, the act of masturbation was always accompanied by labored breathing and by *facial spasms*¹² at orgasm. Repression was operative through incest taboo (mother-sister fixation) and through father prohibition, for the father would whip him or put him in a tub of water when he caught him at "it." Under these punishments he stated he would become tense and then breathe as "if he had run a hundred yard dash."

Runge's case also showed similar relationships between a highly complex series of procedures and masturbation as already noted.

As a final end (purpose) sought for in the "trance" the present conception indicates a complete regression into the mother in the psychoanalytic formulation of the "Mutter leib" phantasy. The evidence at hand is still slight relative to this situation but the typical severe "anxiety"—even "agonal" in both Cases I and II—is here held to be correlated possibly with the "Trauma of Birth" conception as outlined by Rank. Special attention may be directed towards the pneumographic tracing of Case I which is evidence bearing upon the return to the "apneic" phase in the libido regression. This phase, with Staercke,¹³ may be regarded as the primary organ erotic phase. In the first breathing tension relief all of the primitive libido-ego may be discharged.

On the 28th of November, 1924, Case I had had a hard trip up from Philadelphia. He had an attack of trance in the taxicab, with a great deal of apprehension lest they (he and brother) would hit an elevated train pillar (telephone-pole accident factor). As he came into the office he was all bent over like an old man. I took hold of him while in the outer office and gave him a friendly shake, saying semi-humorously, semi-threateningly, "limber up" and also gave him a mild slap on the back, with a "brace up," etc., admonition. I noted a slight but definite expression of displeasure at this more or less commanding attitude of mine, but we went through the hour until the very end, when I asked him what had

¹² See a vast literature on these facial spasms, yawnings heretofore all grouped as "hysterical." Saussure, l.c., who cites Gilles de la Tourettes *Traité*; Pitres' *Léçons*; Charcot's *Léçons*, and a number of others, and enters very fully into the yawning situation, tics, and respiratory anomalies. Saussure also records some compensatory relationships between the breathing and the facial spasms in the sense already noted for Case II.

¹³ Staercke. *Psycho-analysis and Psychiatry*. Int. Jl. Psa., 2, pp. 361-415, 1921. Tr. from Int. Zeit. f. Psa., by D. Bryan.

come to his mind as I poked him up. He hesitated and then finally blurted out, "I wanted to say, 'Cut it out—God damn you! I hate you!' You were so like father trying to make me get up in the morning. The G. D. S. O. B." He was quite agitated when he left.

On December 1, the next visit, he narrated with difficulty that he had had a terrible time. He did not want to get up in the morning. He did not want to come to see me. He had stayed in bed most of the time between feeling "awful." He had called his mother repeatedly to come and sit on the bed by his side and hold his hands. He had horrifying ideas of her death. He was very apprehensive about her. Sunday (November 30) he had stayed in bed all day. He called his mother frequently. He had several trance states, cold hands, contractures, face tight, muscles of mouth all twisted up. Could not sleep until 3. He dreamed a series of fragments as follows:

(1) *I was on a ferryboat with my brother. The boat hit another and started to turn over. I got my coat off ready to jump in. People were running around in great excitement. (I awakened, with my heart pumping fierce in great agony. "My heart was almost like it was when I had my delirium.")*

(2) *Down at the dock. A man was drowning. My brother tried to save him and he fell in and I did not jump in for someone else dragged him out as I was about to go in.*

(3) *I had married a man, somewhat your size. There were a lot of boats and I contemplated going to sea to run away. They were going to ship this man out. Later I was locked up for doing this, but I was free to see my parents. When I was locked up, the "fath"—no, the man was there.*

(4) *My little kid sister was in the subway crying. I recall waving my banjo at her and then I ran away as though I were teasing her about the banjo.*

The dream was accompanied by much feeling. His associations with ferryboat caused a great wave of feeling and he put his hand on his heart and could not give any association by reason, he said, of the great pain he felt there.

The dream quite evidently showed the Oedipus setting. "*He had married a man like me.*" His mother is a large stout woman, as large as myself. He had married his mother and was locked up for it—great anxiety, "*when he was locked up the 'fath'—*"—here he started to say "father," but no, I (*i.e.*, the mother) was there—*i.e.*, the identification of myself and father, and married to the mother.

The turning over of the ferryboat and the drowning man (*also like me*: brother and I are about the same size and coloring—mother) was equated with drowning with the mother—*i.e.*, the return—to the mother. The details are complicated.

Here one is dealing with extremely complex primitive situations and interpretations have to be checked up from various sides. I do

not know just how correct I may be in my assumption, but I have frequently understood a dream of having intercourse (by symbolic action) with a "drunken girl"—as return to the mother, just, as is well known, that men who are impotent with women, unless they are partly drunk, are being inhibited, when sober, by the mother-incest taboo. The following dream is offered as material along this line. It occurred in this series of December 8:

"It was at a party. There were lots of girls and lots of fellows. I think I was alone. I met one fellow who asked me, 'Where's your girl?' I said I would have brought her but she was drunk. I recall going upstairs and then down again after leaving my coat upstairs."

There were indications from the associations that the girl was an older sister. The man who asked "*Where's your girl?*" was suggestive of the brother-in-law. The psychoanalytic equation of up and down stairs=entering into=intercourse (party). "Lots of boys and girls"=much tension. Leaving his coat="naked" (?). Ergo: Entering naked into the female who was drunk, *i.e.*, "deep in the unconscious"—*i.e.*, antecedent to the "girl"—before the sister=mother. Whether this equating is valid I must leave for a more detailed discussion of the associations.

There were other symbolizations of the regression towards the uterine state which were never as heavily loaded—with libido—as are found in the schizophrenic regressions. They had much similarity to the periodic regressions of the epileptoid states. This is another angle which will not be discussed in this connection.

The points of chief value here are the apneic phases of regression, the trance, the partly bent position, and the greasy face, as all bearing upon the principle of dissolution of function, or diaschisis, psychologically viewed as the "return to the mother."

Hughlings Jackson's idea of the "Unity of Medicine," its modern slogan of, study the "organism as a whole," thus permits one to turn aside from the puerile question as to the "functional or organic," "mind or body" nature of the problems involved. Such ideas as "functional and organic" as categories, belong to the cradle days of intelligence.

In the conception of release of functions at older and still older levels, no matter how the upper level mechanisms are abrogated (this is a matter for our theoretical discussion of the dynamics of repression from the Ego to the Id), we have a useful monistic working conception that replaces the earlier parallelism of body vs. mind—somatic vs. functional. The rôle of early conditioned reflex activities, *i.e.*, "wishes" in their psychopathological setting thus comes into relief and can be utilized therapeutically.

A much more extended discussion of the apneic phase would be justified seeing it as a mass of untold primitive sources of conduct. In crude chemical metaphor one needs but recall what an enormous number of products (hundreds of thousands) have been isolated from "coal tar." Thus in an analogous manner one may see the trance-unconscious states as returns to such a "coal tar" condensation period.

Here the metapsychological mental system of the Id offers its help. The Id may be conceived of as such a primitive "coal tar" system. To return to it offers unlimited opportunities for discharge of tension, chiefly by autoplasmic mechanisms, which can repudiate the more allied-to-consciousness mental systems of the Ego. Economically speaking, *i.e.*, Freud's idea of economy of energy discharge, no new adjustments to reality are needed. The patient can retire into "unconsciousness." The symptom formation—at various levels, from higher to lower—socially permitted coitus—incest coitus—heterosexual masturbation—homosexual masturbation—autoerotic organ gratification—these can all be repudiated in favor of complete submergence in the most archaic of systems for instinct mastery (*i.e.*, the Unconscious). One thinks of Hamlet's "And in that sleep of death, what dreams may come."

In order to envisage how this may take place, Freud has conceived of a subsidiary mental system—the Super-Ego—which, as Alexander expresses it, is a boundary formation—a diaphragm. Possibly in the fantastic conception of Crile,¹⁴ analogous to his "lipoid film" which he conceives of as determining all positive and negative electrical tension discharges, equilibrating his physico-chemical systems.

The study of "dream censorship" led to Freud's conception of the Super-Ego; for the question was forever uppermost in Freud's mind, why the *distortion* in the dream. Why, as a single example, was Case I in his dream of December 1(3) married to a large man (me) instead of a large woman (mother)? What prevented the conscious stating of the wish in undisguised form—in the dream—or what prevents the crude symptom emerging in behavior, instead of "panting," or "breathing," or "salivation," or "polyuria," "facial spasms," etc.?

How can the conception of the Super-Ego, as a boundary line mental system, aid in elucidating these *distortions*? As Sidney Lanier expressed it in his "Harlequin of Dreams," "that peep betwixt the legs and mock the daily round."

¹⁴ Crile. Bipolar Conception of Life, 1926.

If the Super-Ego represents a "configurational" system ready as a whole, differing naturally in each individual as to capacity, to relieve the Ego from the task of regulating the instinctive life, then a study of what builds it up and how it functions is of moment.

In a broad manner of speaking, the Super-Ego may be seen as a series of learned rules; as Alexander phrases it, a sort of "introjected legal code of former days which makes it possible to avoid encounter with reality by adherence to its ordinances, and by a system of rigid categorical imperatives obviates the necessity of fresh reality testing." In a sense, it is a part of that "knowing so many things that are not so" of Josh Billings' familiar quip. It is a part of every antiquated system of pedagogy, of nearly all law, of much medicine. It is represented in its quintessence in the dogmas of religious systems, and in a host of other conscious social expressions. Because external reality is always on the move, and the individual's instinctive sexual life constantly grows towards maturity; because of the tendency towards premature fixation—habit formation; because it looks inward, not outward, and hence has little or no access to reality, but is always concerned with the instinct life, the Super-Ego mental system tends to become almost reflexly automatic and rigid. It is almost structuralized function.

There it stands looking inward towards instinct, with its primitive codes of reward and punishment, separating the Id from the Ego which latter has no access to the instinct life, but is always a reality tester. As I think of Bergson's conceptions, I think I can see in Freud's Id, Bergson's Instinct; in Freud's Ego, Bergson's Intelligence; whereas Bergson says "there is no bridge," Freud says the Super-Ego "is the bridge." Had Bergson understood the dream dynamics better I conceive his idea of the unbridgeable cleft between instinct and intelligence would have been different.

In the mental systems of the encephalitic it is not difficult to trace the influence of the Super-Ego mental system. One frequently wonders why so many of these patients lack punch; they are, as it were, half asleep, so far as initiation is concerned. This lack of impulse, this semi-torpor in muscle, in thinking, in feeling even, as already noted, has been the object of many studies. When seen from the standpoint of the Super-Ego some new light seems to be thrown upon this situation dynamically. Histo-physio-pathologically it may be granted that this semi-lethargy may be in some sense related to v. Economo's sleep center notion—the central gray of the third ventricle, or wherever it may be—but even so what is the dynamic situation in larger configurational terms? What is this screen, as it were, which forces the energy to run counter to reality and serves to push

back instinctive processes to earlier stages of their expressions and will not permit new efforts to regain what has been lost? In crude terms, what has played hell with the *morale*? As already intimated the lack of impulse is only apparent. There is, as in the schizophrenic, plenty of impulse but it is inhibited, repressed. What is the mechanism of this inhibition, psychologically speaking? Pathophysiologically considered we have seen the trauma that interferes with the functioning of innumerable pathways which might discharge tension at higher levels, hence increased pressure on instinctual outlets at lower levels. Here is where the Super-Ego is active.

On the side of the incest prohibition, the Super-Ego seems to prohibit all genital sexuality. It raises up such a "sense of guilt" that the patient is pushed back to an autoplasmic form of gratification which tragically enough gives it, by this camouflage, the very thing—*i.e.*, incest wish gratification, which it denies. The symptom, "breathing," "salivation," represents a discharge of tension at the Id level. This the Super-Ego permits. But the Ego refuses to acknowledge its real nature, and in therapy, raises up resistances against revealing it. Just as in life the patient resists everything, approaching the negativism of the schizophrenic, and differing from it only volumetrically.

Some evidence has been given concerning the regressive autoplasmic respiratory-erotic gratification of the unconscious incestuous wish in Case I. Case II showed similar mechanisms in her dream life. This is accented only because, in a general sense, orientation towards the Œdipus situation affords a starting point in the therapeutic attack. No such crude ideas as taxing the patient with it is ever thought of—this much for the critics, totally uncomprehending the entire *modus operandi* of the unconscious.

The very first dream brought by Case II; long before a word had been said about psychoanalysis, or what was the matter with her, but in the period when one was concerned solely with the gross phenomena, the history taking, etc., was as follows:

My brother (the sick one, with a schizoid postencephalitic illness) *and I were in a room of our Philadelphia house. We were seated in different parts of the room smoking cigarettes. I turned my back for a moment and then noticed at the base of the mantelpiece, where the fire is, a garden hose. My brother took hold of this and began to sprinkle me and the whole room. I screamed and some people (four or five) came and took it away from him."*

This dream was obtained on the second interview, with a group of others, and furthermore, was dreamed before she even had seen me.

It, with the other fragments, had been remembered as a dream of recent date.

No memory material has ever been unearthed, in later efforts, to get at the details of the dream but at least three situations are possibly revealed. The incestuous wish—*i.e.*, the attack by the brother's phallus (*the garden hose*) is evident: the infantile urinary impregnation phantasy (*sprinkling*) is probable; in fact has been proven from later analytic material. Like many another child she thought that babies came through a urinary process. The third, least obvious, situation is the anal erotic one. *When her back was turned.*

Reviewing the last situation first, it is known that the patient had always been an extremely obstinate, self-willed girl. Her parents state "they could do nothing with her." "She always had her own way." Reference has been made to the fact she never gave up her finger sucking. She was persistently constipated. Only after several months of treatment has this improved. Enemas were frequent all during her infancy and childhood. She was stubborn, and remains even more so now in her regression. Only after six months after seeing her has she given up her bed-pan at night, whenever she wants to urinate. She has made her mother an absolute slave and tyrannizes over every one in her surroundings, through obstinacy, threatening to suicide if she doesn't get this or that, and other whims and caprices in general.

Her polydipsia and polyuria have been quite classical but need not be discussed further in this place.

As to the genital organization stages, discretion prevents a complete description. Masturbation was begun at six to seven, mutually with another girl of about the same age. She knew it was naughty but she "enjoyed it," and kept it up with this girl about a year. As the analysis of this patient is not in point, no further details are pertinent.

Enough may be said, however, to indicate deep regression to auto-plastically evolved respiratory-erotic substitutes for adult coitus (male partner, however, identified with brother as narcissistic introjection of herself). Thus she has never matured psychosexually. Fully 75 per cent of her dreams show the homosexual—*i.e.*, narcissistic fixation. There is great concealed reproach (melancholia mechanism; hence possible suicide must be guarded against).

The analysis is quite incomplete and hence little light can be gained concerning the Super-Ego prohibition stages. This would entail extended discussion of the family milieu which cannot be entered into here.

(To be continued)

SOCIETY PROCEEDINGS

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MEETING, THURSDAY, APRIL 15, 1926,
DONALD GREGG, M.D., PRESIDENT, IN THE CHAIR

CAMILLO GOLGI, 1843-1926

DR. HENRY R. VIETS

Professor Golgi died January 21, 1926, in his eighty-third year. His life was largely spent in Pavia, where he taught histology and pathology for forty-three years, from 1875 to 1918, and where he made most of his observations on the minute architecture of the central nervous system and on malaria. His collected works appeared in 1903. Golgi discovered the silver chromate method for staining nerve cells and added much to our knowledge of the cells of the nervous system by his descriptions of tissue stained in this manner. He also made important contributions to medicine by his studies of the malarial parasite. An extended notice of his life has appeared in the *Archives of Neurology and Psychiatry*, May, 1926, and in the *JOURNAL OF NERVOUS AND MENTAL DISEASE*, of April, 1926, with portrait.

RECIPROCAL INNERVATION OF ANTAGONISTIC MUSCLES AND THE COORDINATION OF MOVEMENT

JOHN F. FULTON, PH.D.

Recent discussion of the problem of the coördination of antagonistic muscles renders desirable a brief statement concerning the present status of the question. Our knowledge of the functional activity of antagonistic muscles had its origin in the neurological experiments of Galen. This author maintained (c. A.D. 180) that an antagonistic muscle remained dormant during activity of a protagonist. The subsequent history of the question has recently been dealt with by Tilney and Pike at length, and need not detain us here. It is interesting in passing to realize that Descartes appreciated the importance of reciprocal innervation of the eye muscles and suggested as a mechanism a peripheral valvular arrangement found only in the first and second Latin editions of the *De Homine* (1662-1664). What I shall refer to as the "classical conception" of the functional activity of antagonistic muscles is based largely upon an extended series of observations, commenced by Sherrington in 1893 and continued down to the present time.

Sherrington's first experiments were concerned with the reciprocal activity of the flexors and extensors of the knee joint (cat and monkey). It was observed that if, during the elicitation of the series of knee-jerks from the quadriceps, the opposing flexor muscles were kneaded or massaged, the knee-jerks became diminished in amplitude. If, however, the hamstring nerves supplying the flexors were cut, such manipulations were entirely without effect. Similarly, when the flexors were made to contract by stimulation of appropriate anterior roots (VII and VIII subthoracic), this sufficed also to inhibit the knee-jerk of quadriceps. This evidence has recently been extended by Liddell and Sherrington in their discovery that the stretch reflex of quadriceps is inhibited by traction upon the opposing flexors. When the quadriceps muscle of a decerebrate preparation is gradually stretched, the muscle responds by active contractions (postural tonus). Other things being equal, the extent of the response depends upon the tension existing at that time in the opposing flexor muscles: if the flexors are completely relaxed, the stretch reflex of the extensors is ample; if, however, the flexors are under tension, the response to the extensors is diminished. In these observations, therefore, we have convincing evidence of the reciprocal activity of this opposing muscle group.

It may be emphasized that the conception of reciprocal innervation does not imply that when one muscle is active the opposed muscle is completely inhibited; it simply means that increase or diminution of contraction does not proceed simultaneously in opposed muscle groups.

The experiments on the reciprocal behavior of the flexors and extensors of the knee joint led, three years later, 1896, to the discovery of experimental decerebrate rigidity. In the meantime, however, the reciprocal activity of the eye muscles was investigated, and it was found that, following section of the third and fourth nerves of a monkey, the external rectus muscle, which alone remained innervated (sixth nerve), could be contracted or relaxed at will, thus demonstrating the power of inhibition of this muscle during voluntary activity. It was found also that inhibition could be produced by stimulation of the appropriate region of the cortex or of the internal capsule. This experiment has been called into question on the ground that relaxation is not observed clinically in patients suffering from combined oculomotor and trochlear paralysis. It is clear, however, that evidence drawn from clinical material, in which lesions almost inevitably develop gradually, and in which, therefore, atrophy from disuse plays an important rôle, is scarcely to be compared with positive results obtained under the ideal conditions of animal experimentation. One may mention in this connection the convincing experiments of de Kleijn who isolated the internal and external rectus muscles (by removing the globe) of the rabbit and elicited nystagmus by irrigation of the labyrinth. When an external nystagmus was produced, contraction of the external rectus muscle was accompanied by *pari passu* relaxation of the internal rectus, showing that spontaneous inhibition of the internal rectus had occurred as a result of contraction of the antagonist. Since these muscles were

completely isolated and attached to independent levers, the result cannot be attributed to passive stretch of the antagonist.

Finally, there is the evidence for reciprocal innervation drawn from experiments on cortical stimulation. It was pointed out by Sherrington and by Graham-Brown and Sherrington that reciprocal activity is frequently observed when certain regions of the motor area are stimulated, but that also, especially with intense stimulation, simultaneous spasm of antagonistic muscles not infrequently occurred. One would indeed anticipate this from the familiar phenomena observed in Jacksonian attacks, and it is also not surprising in view of the fact that, by voluntary effort, antagonistic muscles can readily be thrown simultaneously into contraction. One must also remember that reciprocal innervation is invariably the rule in spinal animals: appropriate ipsilateral stimulation of any nerve gives rise unfailingly to contraction of the flexors and relaxation of the extensors. That the more highly integrated voluntary activities should under some circumstances differ from the simple reflexes of the spinal cord is scarcely a matter for surprise, a point early emphasized in Sherrington's investigations.

From the experimental standpoint it cannot be too strongly emphasized that the only adequate way of estimating activity in a muscle is by measuring directly the tension which it develops at any given instant. Electrical responses are wholly useless unless one have proof of synchronization of response of individual elements. Thus, when a muscle is being inhibited it not infrequently gives rise to far larger electrical responses than were observable during the height of the reflex contraction. Estimation of tension by means of tambours applied to the external surface are also inadequate, since any deformation of the shape of the muscle, whether it be due to increase of activity, diminution of activity or mere passive movement, is likely to give the same result, as Marey early emphasized. On this account, the adherents of the classical conception of reciprocal innervation find altogether inadequate the evidence recently put forward against it.

Discussion: Dr. Stanley Cobb: I have been especially interested in this subject for several years. There is nothing that I can add to Dr. Fulton's excellent exposition. We must remember that Sherrington's observations were observations, not theory. All of us who have repeated his experiments have seen the phenomena of reciprocal innervation. That simultaneous contraction of antagonists occurs under certain conditions, as recently brought out by Tilney, can in no way lessen the importance of Sherrington's experimental data. We must harmonize the observations into a theory including both (as I said in discussing Dr. Tilney's paper at the A.N.A. meeting in 1923). This evening Dr. Fulton has done this in a very adequate and satisfactory manner, giving references to Sherrington's papers which show that Sherrington knew that reciprocal innervation did not regularly occur at the most highly integrated levels.

Dr. Henry R. Viets: I think the contribution of Dr. Fulton's, from the physiological laboratory, is an important one. The principle of reciprocal innervation is fundamental. As time goes on we are

going to classify it with the researches on the anterior and posterior nerve roots by Bell, and Waller's work on nerve degeneration. It does not seem as though it is possible to overthrow, although attempts have been made to do so, the careful observations made by Sherrington and his co-workers in the last sixteen years. We may have to modify the doctrine of reciprocal innervation as time goes on, but, I believe with Dr. Fulton and Dr. Cobb that this fundamental principle will not be overthrown as the result of future research.

CONSTITUTIONAL PSYCHOLOGICAL FACTORS IN "FUNCTIONAL PSYCHOSES"

1. *Manic-depressive Insanity*

DR. HELGE LUNDHOLM

This paper attempts to make a comparative application of two new aspects of manic-depressive insanity on clinical facts. One is the view of Professor McDougall, expressed recently in an article in the *British Journal of Medical Psychology*, according to which the manic and the depressed phase of the disorder should be due, the former to an overbalance of the instinct of self-assertion, the latter to an overbalance of the instinct of self-submission; the other is a view, devised attentively by the author of the paper.

The theory of the author is based on the acceptance of the cycloid and schizoid make-up as constitutional factors, in accordance with the suggestion of Dr. Kretschmer. By cycloid make-up is meant, however, only a disposition to develop moodiness; by schizoid, a disposition to split in the psychiatric sense of the word. A second assumption is the one of innate A- and E-tendencies, that is, tendencies to develop altrocentric and egocentric personality traits. These tendencies, which roughly cover the extrovert and the introvert make-up, are provisionally considered as independent of the cycloid and the schizoid trait, this in opposition to the view of Kretschmer. The altrocentric traits are: the extrospective, the extroactive and the sympathetic; the egocentric traits are: the introspective, the seclusive and the egotistic. Of these traits, on practical and theoretical grounds, sympathy and egotism are assumed to be the most fundamental; compared with them the others are superficial.

Besides the cycloid and the schizoid make-up and the A- and E-tendencies, the human being has other innate dispositions such as the instincts. In the course of life all these dispositions act upon each other in a way either to support or inhibit each other. Speculating on the influence of the A- and E-tendencies on the instincts which are crucial in our discussion, we may acknowledge that strong A-tendencies might favor the development of both the self-assertive and the self-submissive instinct depending upon conditions, while strong E-tendencies might well favor the development of self-assertion but inhibits entirely the development of self-submission.

Accepting this as true and accepting also McDougall's hypothesis as true, we would expect to find in the manic patient—the self-assertive—altrocentric traits or egocentric traits or both, while, in

the depressed patient—the self-submissive—we would expect altrocentric traits, but under no conditions egocentric. The application of the six personality traits, given above on the two phases of manic-depressive disorder, reveals to us that the manic patient is both egotistic and sympathetic, while the depressed patient manifests few, if any signs of sympathy, showing on the other hand particularly in cases of agitated depression, obvious marks of egotism. Thus we may conclude that the depressed phase of the disorder can not be adequately explained as due to an overbalance of the instinct of self-submission.

The hypothesis we suggest to take the place of McDougall's is as follows: The manic-depressive patient is innately furnished with both the A- and E-tendencies, the latter, however, being stronger than the former. During the prepsychotic period when, according to observations, he is generally of the sympathetic type, the E-tendencies are inhibited by social or moral agents. When fatigue or physical disease sets in, these inhibitions break down and allow the E-tendencies to dominate. The phase in which the patient enters into the disorder is not dependent on the E-tendency, but must be considered as ultimately determined by the mysterious x of his cycloid make-up. Thus it is the combination of the cycloid make-up with strong E-tendencies which predispose the development of manic-depressive insanity. Strong A-tendency in a cycloid does not lead to the psychoses even under very distressing physical suffering.

The A- and E-tendencies should be thought of as an agent distributing conative energy into different instinctive channels. While the instincts have very specialized biological purposes the A- and E-tendencies have only general purposes in two directions, the A-tendency in the direction of furthering the race, the E-tendency in the direction of furthering the individual. As such, each one of them might favor or disfavor a number of different instincts. This also is what we see in extreme form in the two phases of manic-depressive disorder. In the manic patient we find a favoring not only of the self-assertive instinct and the pugnacity instinct by the E-tendency, but also of the curiosity instinct by the A-tendency and of the gregarious and sex instinct by perhaps both the A- and the E-tendency. In the same way we find in the depressed patient a disfavoring of the curiosity instinct due to the absence of the A-tendency, and a favoring of the self-assertive and the pugnacity instincts—this particularly in the agitated depression—by the strong E-tendency.

The necessity to consider the A- and E-tendencies innately independent of the cycloid and schizoid constitutional factor is obvious since we have seen that a strong E-tendency is one of the psychological determinants of manic-depressive insanity.

Discussion: Dr. William McDougall: Dr. Lundholm has raised so many very interesting points and has covered so large a field of problems that it is very difficult to attempt to criticize. I am glad to find that Dr. Lundholm, from the standpoint of his clinical experience, has consented to take my hypothesis seriously and apply to it the test of clinical observations. It was in order to stimulate clinical

workers that I ventured to put forth that hypothesis; so I find that it is already justified and I need not wish to take it back. Of course, it was impossible for Dr. Lundholm to state the whole case for my idea. He gave a very fair selection of extracts in the course of his exposition. I would like to add that in my view the strength of the hypothesis is greatly added to when the hypothesis of the dementia precox, which I put forward later in my recent volume as a complementary hypothesis, is taken in conjunction with it. The fact that the hypotheses fit together means, I think, that they are reciprocally supported. Of course, I do not mean to suggest that the hypothesis was in any sense adequate to all cases. There must be a great variety of cases. I merely suggested that it interprets a nuclear phenomenon in all cases of this type. Dr. Lundholm's principal clinical objection to the hypothesis of manic-depressive which I have suggested was, I take it, drawn from the observation of agitated melancholia; but he did not mention what seems to me the essential point in my suggestion as regards agitated melancholia, namely, that the agitation is largely the expression of fear. That seems to be borne out by my own experience in such cases, and I find in the literature strong support for this view. If that is true, fear complicated the attitude of shrinking submissiveness in the agitated melancholia. Dr. Lundholm finds another objection in the fact that melancholic patients are not always purely passive and inert. But if the theory be true, it does not follow that we should expect no urge, no drive towards a goal in these people. The submissive impulse has a certain urgency; it drives for its natural goal; and it is the manifestation of this urgency which Dr. Lundholm interprets as self-assertion in these patients. In that way I would try to meet the main objections which Dr. Lundholm raises. That is, perhaps, as much as I should say in my own defense.

I should like to make a slight criticism of Dr. Lundholm's scheme. I am inclined to criticize the term "egotistic." It seems to me utterly ambiguous and misleading. I do not see that egotism and altruism are mutually exclusive. I think a man can be egotistic and at the same time altruistic. Dr. Lundholm suggests that egotism (which is something ambiguous, undefined, something which should be stated very carefully) is the very essence of introversion. In this he follows Jung who describes introversion in some of his writings as an extreme degree of egocentricity. That does not seem to me to be an acceptable view. The extrovert may be and often is very egotistic; therefore, egotism cannot be the very essence of introversion. That would be my main criticism of the scheme.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Borchard, A. SURGICAL TREATMENT OF ANGINA PECTORIS. [Arch. f. Clin. Chir., 1923.]

A clinical report of this operation on a man of fifty-four who was having daily attacks of angina pectoris, with good heart action. Borchard resected the depressor nerve and also removed the superior ganglion of the cervical sympathetic. The patient died in less than three weeks with symptoms suggesting a focus of softening in the left fossa of Sylvius. The angina attacks ceased after four days.

Yakovlievitch, V. PERIARTERIAL SYMPATHECTOMY FOR MAL PERFORANT. [Lyon Chir., Dec., 1923.]

Report of two clinical cases of mal perforant persisting for at least a year in one and seven years in a second. Both patients were healed of their perforating ulcers within a month.

Kohler, R., and Weth, G. CERVICAL SYMPATHECTOMY FOR ANGINA PECTORIS AND ITS AFTER-EFFECTS. [Ztschr. f. klin. Med., XCIX, 205. Med. Sc.]

A case of severe angina pectoris is recorded in which left cervical sympathectomy was performed, with removal of the lower pole of the superior cervical ganglion together with the ganglia beneath it as far as the stellate ganglion. The patient was kept under observation for some time and numerous investigations were carried out. The result of the operation was complete relief from the anginal symptoms. Paroxysmal rises of blood pressure no longer occurred though the average pressure remained as before. It was noted that blood pressure in the left arm was now constantly 5 to 20 mm. Hg. less than in the right arm. The left eye showed pupillary contraction, enophthalmos, and ptosis. The secretion of tears was at first increased, as was also the vascular supply of the conjunctiva—both, however, soon returned to normal. Sweat secretion was abolished on the left side of face, the neck, and left arm. The skin over this area also showed a temporary vascular dilatation, indicated by flushing and increased temperature, but, after this had passed off, hyperemia, however caused, was more easily induced and remained longer on the left than on the right—which, together with the lower blood pressure, is taken as evidence of persistence of lowered vascular tone. Local vaso-

constrictor effects were unchanged, as was also the reflex red flush to mechanical or chemical stimuli.

Samojloff, A. THE POSITIVE VARIATION OF THE RESTING CURRENT IN THE TORTOISE'S AURICLE WITH VAGUS STIMULATION. [Arch. f. d. ges. Physiol., CXCIX, 579-94.]

Garrey, W. E. EVIDENCES OF ELECTROPOSITIVITY IN THE HEART DUE TO VAGUS STIMULATION. [Am. J. Physiol. (Proc.), LXVIII, 128-9. Med. Sc.]

A positive variation of the resting current of the auricle consequent upon vagal stimulation was first described for the tortoise by Gaskell, and later for the mammal by Eyster and Meek, the former regarding the phenomena as an anabolic effect produced in the muscle fibers by vagal stimulation. He contrasted it with the negative variation produced on stimulating the nerve of a somatic nerve muscle preparation, which is usually ascribed to a katabolic process. The phenomenon was, however, seriously questioned by Einthoven, who showed that movements of the lung produced a positive variation by stretching the auricle. He concluded that vagal stimulation brought about the variation, not by its effect upon the auricle, but by stimulation of contractile elements in the lung. Samojloff has reworked the question very thoroughly, and agrees that lung movements may give rise to fallacious results, but that the phenomenon is still present if the lung is snipped into pieces so that movement is completely abolished, or if the heart is isolated and removed from the body with the vagi intact. Garrey has been able to obtain the phenomenon in selachians which have no lungs and in the turtle's heart removed from the body with the vagi intact, and to show that the vagal action is homolateral. These two papers dispose of lung movement producing the phenomenon, and show the effect to be located in the heart. Vagal anabolism still remains unproved, however, for, knowing that stretching of the auricular wall may produce a positive variation, it is still possible that vagal stimulation may stimulate some contractile elements in the heart, not belonging to the heart muscle itself, which, stretching the muscle fibers, gives rise to the positive variation.

Schilf, E. PHYSIOLOGICAL OBSERVATIONS ON PERIARTERIAL SYMPATHECTOMY. [Klin. Wchnschr., III, 346. Med. Sc.]

Plethysmographic records have been taken from the legs of dogs and cats, the femoral artery and crural nerve being exposed. Electrical stimulation of the arterial sheath, before section of the nerve, gave a rise in the volume curve indicating vascular dilatation. Stimulation after section of the crural nerve was without effect. Perfusion experiments yielded similar results. It is concluded that in cats and dogs there is no material number of efferent nerve fibers in the sheath of the main artery which pass down to supply its end branches.

Staemmler, M. ON THE PATHOLOGY OF THE SYMPATHETIC NERVOUS SYSTEM; ITS IMPORTANCE IN THE AETIOLOGY OF ARTERIOSCLEROSIS. [Beitr. z. path. Anat. u. z. allg. Path., LXXI, 388. Med. Sc.]

Histopathological and experimental investigations, the results of which are summarized in the following conclusion: a chronic inflammatory process may develop in the sympathetic ganglia in consequence of various kinds of poisonings chiefly of bacterial origin. The process is characterized by a degeneration of the nerve elements and a proliferation of the sustaining tissue (cells of the connective tissue capsules and stroma). It leads to various disturbances of the vasomotor reflex apparatus and to abnormal changes in the blood pressure, which are perhaps sufficient to cause at first an alteration of the media and then a sclerosis and degeneration of the intima of arteries.

Pal, J. ARTERIAL HYPERTENSION. [Klin. Woch., Vol. II, June 18.]

With most logically trained physicians Pal considers high blood pressure only a symptom, not a disease. It is caused by functional change in the arteries (predisposition to excessive contraction) and starts with "vascular crises" which may be overlooked by the patient. Later on the pressure remains permanently high. He uses the term "hypertension" to designate high pressure in the arteries, and the term "hypertonia" for the increased tonus of the arterial wall, which may persist even if the pressure is low (for instance with heart failure). The primary permanent hypertonia is an angiotonic neurosis, which causes severe anatomic lesions. Its frequency has increased lately. Psychogenic factors are included.

Allen, F. M., and Sherrill, J. W. TREATMENT OF ARTERIAL HYPERTENSION. [Jl. of Metab. Res., Oct., Vol. I. J. A. M. A.]

Allen and Sherrill describe 180 severe cases of hypertension treated by close restriction of the sodium chlorid intake, for periods from one month to three years. Fully normal blood pressure was restored in only thirty-four cases (18.9 per cent). In seventy-five other cases (41.9 per cent) the relief of hypertension and other symptoms was sufficient to be regarded as a distinct therapeutic success. Transitory benefit, followed by relapse or death after several months, was obtained in sixteen cases (8.9 per cent). Complete failure of treatment was encountered in fifty-five cases (30.5 per cent). The total mortality for the four year period was twenty-five (13.8 per cent), with no appreciable difference between cases of long and short duration, as success or failure is determined by the character of the case rather than by a time element. Incomplete and unsuccessful results are believed to be due to organic changes which cannot be removed by a treatment based only on the principle of functional rest. In successful cases not only are symptoms relieved but the progressiveness is arrested, so far as the present duration of observations can decide. The chief requirement for success, which needs emphasis

above everything else in the use of this treatment, is that sufficiently strict salt privation must be carried out for a sufficient length of time. Facts are presented to show that the therapeutic results described are not due to physical or psychic rest, protein restriction, or general undernutrition. Chlorid restriction has acted favorably on the serious accompaniments of hypertension, such as cardiac failure, incipient pulmonary edema, and vascular crises, including to some extent angina pectoris. The authors believe it to be the best treatment for eclampsia in the broad sense, though in the puerperal form an active toxic process, comparable to that in acute nephritis, may seriously limit the possibilities of any dietetic treatment. With due allowance for other possible causes and treatments, these observations create the impression that sodium chlorid is the most important direct factor in nephritic retinitis, either with or without hypertension, and the arrest of this process by salt privation is highly important practically and theoretically. It appears rational that sodium chlorid, as the principal osmotic regulator of the body, should play an important part in such phenomena. Clinical experience supports the view that chlorid restriction acts powerfully not only in relieving immediate symptoms but also in checking the progressiveness of the condition.

Jonnesco, T. THE RESECTION OF THE SYMPATHETIC NERVE IN ANGINA PECTORIS. [*Presse méd.*, XXXI, 517. *Med. Sc.*]

Daniélopou and Hristide have criticized Jonnesco's surgical treatment of angina pectoris on the grounds that such interference must adversely affect the heart. Sympathectomy has, they state, the following effects: it destroys the vasodilator nerves of the heart and so diminishes the coronary flow; it breaks the vasoconstrictors of the lung, and so tends to produce pulmonary edema; it alters the fundamental properties of cardiac muscle; it does not remove all sensory paths, as the vagus is left intact. The author, after considering these points in the light of physiological knowledge, gives the results of 200 cases in which the sympathetic nerves have been resected on both sides, usually including the first thoracic ganglion. These operations were performed for the relief of epilepsy, exophthalmic goiter, angina pectoris, migraine, and for other reasons. He has reviewed these cases after periods of five to twenty years and has never found any unfavorable influence on the heart consequent upon the operation. The three angina cases so treated have all shown marked improvement, not only from the point of view of pain, but also of their capacity for effort. He feels he has still good reason to continue his practice, and to recommend total extirpation of the sympathetic in cases of angina pectoris.

Kropveld, S. M. PERIARTERIAL SYMPATHECTOMY. [*Ned. Tijd. v. Geneesk.*, May 10, 1924.]

The hypotheses advanced to explain the action of Leriche's operation are still unsatisfactory. Dilatation of the artery, which is evident even a

month later is certainly a factor. This dilatation has a favorable influence on trophic disturbances, but why is this favorable influence so uncertain? Recurrences have been observed, hence the purely artificial nature of the therapy. It is purely empirical.

Hellwig. PERIARTERIAL SYMPATHECTOMY FOR MIGRAINE. [Arch. f. Klin. Chir., 1924. J. A. M. A.]

For the therapy of extremely grave migraine, Hellwig suggests surgical interference consisting of periarterial sympathectomy on the internal and external carotids, close to the base of the skull. For about two weeks the side operated on shows an increased temperature, as compared with its mate. But the almost instantaneously disappearing pain has no tendency to recur. The success of this operation is based on the theory that migraine is either a peripheral, central or reflex angiospasm, closely akin to acroparesthesia, erythromelalgia and intermittent claudication. In its etiology, abnormal suprarenal functioning is supposed to be of import, beside a general angiospastic predisposition. He reports experimental but no clinical experience with pericarotid sympathectomy.

Adler, F. H., Landis, E. M., and Jackson, C. L. ACTION OF THE SYMPATHETIC ON THE OCULAR BLOOD VESSELS. [Arch. Ophthalmol., May, 1924, 239.]

The relation of the sympathetic to the intraocular pressure is here investigated. Normally, when there is a slow rise of blood pressure the intraocular pressure also rises in proportion. This increase of intraocular pressure is, however, controlled normally by a local vasoconstriction of the ocular blood vessels by means of the cervical sympathetic—a protective mechanism safeguarding the eye from sudden rises of intraocular pressure. When the cervical sympathetic is cut no effect is seen on the intraocular pressure at normal blood pressures, but as the general pressure rises the intraocular pressure goes up much higher than when the sympathetic is intact. These experiments therefore afford experimental proof that there is in the eye a mechanism which can control changes in the general blood pressure as affecting the intraocular pressure, and that this mechanism is innervated by the sympathetic.

Kylin, E. CLINICAL AND EXPERIMENTAL STUDIES OF HYPERTENSION. [Sven. Läk. Hand., June 30, 1923. J. A. M. A.]

Kylin reports the results of his study, started in 1918, in 156 pages, and reviews the literature. He considers the capillary pressure the central problem in kidney pathology. He discusses arterial or essential hypertension and the hypertension with glomerular nephritis. In essential hypertension there is no injury of the capillaries, and the blood pressure is characterized more by great fluctuations than by a high level, the rise and fall being due to impulses which cause constriction or dilatation of the vessels. Even a high pressure may be unaccompanied by kidney

disease, the vascular injury being located in the arteries. Carbohydrate tolerance is less in essential hypertension than in normal conditions, and the disturbance of the vegetative nervous system is indicated in certain diabetics in whom mental states cause glycosuria more easily than in healthy individuals. There are no edema or retinal lesions; capillaries and capillary pressure are normal but there are pathologic diurnal variations in the blood pressure, paradoxical reactions to epinephrin, increase of mononuclear elements and frequently increased blood sugar. In glomerular nephritis the hypertension is due to injury of the capillaries caused by toxins of certain acute infectious diseases, and this precedes the symptoms of kidney disease. It is accompanied by edema, high capillary pressure, retinal lesions, normal or only slightly increased diurnal variations in blood pressure, normal reactions to epinephrin and normal blood sugar. Though urinary symptoms appear only after hypertension has set in, glomerular nephritis is concomitant with, rather than the result of, hypertension, which is indicated by the fact that the abnormal pressure may disappear even when the kidney lesions remain and cause death. He concludes that this division of hypertension leads to two different lines of research, one including the capillary system, with edemas, cellular tissue nutrition and the contractility of the capillaries, which he calls the peripheral heart action, while the other line includes the vegetative nervous system and metabolism.

Reid, M. R., and Eckstein, G. SENSORY DISTURBANCES FOLLOWING SYMPATHECTOMY FOR ANGINA PECTORIS. [J. A. M. A., July 19, 1924.]

Following a left cervical sympathectomy for angina pectoris, the patient whose case is here reported, developed pain that simulated trifacial neuralgia. There occurred marked sensory changes in the entire left half of the body, from the head to the costal margin. When Head's tests were applied to this region of the body, the following results were obtained: (a) Epicritic sensibility was absent; (b) superficial pain remained, but was much reduced; (c) the threshold for pressure pain was markedly lowered; (d) within critical limits, the power to perceive increments of heat and cold was absent; (e) discrimination for roughness and texture was gone; (f) vibration was perceived only over the mastoid bone; (g) recognition of two points was absent; (h) protopathic sensibility was diminished; (i) sense of position, weight and passive movement was disturbed; (j) correct appreciation of shape and size was lacking in both two and three dimensions.

Savic, V. VASOMOTOR ANGINA PECTORIS. [Deut. med. Woch., Vol. XLIX, June 8.]

According to this observer the type of a pure vasomotor angina shows pain which does not spread to the arm, and there is no special apprehension

of death. Other signs of vasomotor instability are usual. In the case of a woman, aged twenty-two, the attacks had always yielded to calcium chlorid and a sedative. Each attack was accompanied by a cyanosis of the fingers and suggested an etiology.

Glaser, F. LEUKOCYTOSIS AFTER "PSYCHIC MEAL." [Med. Klinik, April 20, Vol. XX.]

Glaser found after a sham meal the same changes of leukocytosis as after real food intake. Both depend equally on changes of the tonus of the vegetative nervous system.

Langley, J. N. THE VASCULAR DILATATION CAUSED BY THE SYMPATHETIC AND THE COURSE OF VASOMOTOR NERVES. [J. Physiol., LVIII, 70-3. Med. Sc.]

Stimulation of the lumbar sympathetic commonly causes flushing of the cat's foot after primary pallor, and occasionally flushing with no appreciable preceding pallor. Atropine decreases the degree of flushing and prevents, or nearly prevents, the occurrence of primary flushing. These facts suggest that the flushing is largely due to metabolites set free by the sweat glands in secretion. Atropine does not, however, prevent ergotoxine from covering the vasoconstrictor action of the sympathetic into a vasodilator action. After section of the sciatic and crural nerves, stimulation of the lumbar sympathetic causes no appreciable pallor of the foot, and after ergotoxine has been given it causes no flushing. Thus periarterial section in man, so far as it relieves peripheral vasoconstriction, in all probability does not do so by severing nerve fibers running with the arteries to the periphery.

Babcock, R. H. VEGETATIVE NERVOUS SYSTEM AND HEART. [Annals Clin. Med., Jan., 1924. J. A. M. A.]

Babcock urges that when a physician is confronted by the problem of deciding the nature and cause of simple tachycardia or attacks of disordered ventricular systoles he should endeavor to discover whether or not there is some irritation within the abdomen or pelvis which is exciting the action of the sympathetic or parasympathetic (vagal) portion of the nervous system. There may be associated valvular or myocardial disease, but such lesions may not be responsible for the seizures. In treating these cases it is essential to remove the cause of the irritation rather than that the heart receive treatment directly.

Halstead, A. E., and Christopher, F. CERVICAL SYMPATHECTOMY FOR ANGINA PECTORIS. [J. A. M. A., Vol. LXXXIII, May 24.]

The development of the operation of resection of the cervical sympathetic ganglions, its technic, and the innervation of the heart are reviewed. In the method employed by the senior author, the incision is made at the anterior border of the sternocleidomastoid muscle. This muscle and the

carotid sheath and its contents are retracted posteriorly instead of anteriorly, as in Jonnesco's operation. The balance of the operation is along the lines laid down by Jonnesco. In one case cited, only the middle cervical ganglion was removed, by avulsion. During removal of the ganglion, the left pupil was dilated and tears came from that eye. The patient's condition was excellent throughout the operation. The post-operative course was of interest. There was a transitory impairment of the left lower lip, which did not have its full motion. Both the pupils reacted to light and in accommodation. On the second day after operation, the blood pressure was 154/100; on the third day, 150/90; on the sixth day, 178/100; on the seventh day, 184/102, and on the ninth day, 178/100. The wound healed cleanly, and the skin stitches, which were the only ones that had been used in the closure, were removed on the sixth day. The patient was discharged from the hospital on the tenth day, and her convalescence at home has been steady and rapid. Save for a mild attack about four weeks after the operation, there have been no anginal attacks, and the diminution of the blood pressure has persisted to date (May 8, 1924).

II. SENSORI-MOTOR NEUROLOGY.

3. SPINAL CORD.

Achard, C., and Thiers, J. CEREBROSPINAL FLUID IN MULTIPLE SCLEROSIS. [*Médecine*, February, 1923.]

Positive colloidal reactions in the cerebrospinal fluid of multiple sclerosis are here reported upon, while the Wassermann reaction is usually negative. The demonstration of spirochetes may be a help in beginning atypical cases. As a rule, in multiple sclerosis, there is neither an increase in albumin nor in cells.

Westphal, A. MOTOR PHENOMENA IN MULTIPLE SCLEROSIS AND DIFFERENTIAL DIAGNOSIS OF ENCEPHALITIS EPIDEMICA. [*D. Zschr. f. Nervhkl.*, LXVIII, LXIX, 128.]

The symptoms which Westphal reports show the great difficulty which arises in distinguishing multiple sclerosis from epidemic encephalitis. His first case showed clinically a severe general chorea which he interprets as perhaps the highest grade of tremor in the form of incoördinated simultaneous movement of widely different muscle groups through even the slightest active innervation present constantly in one place or another, even in apparent rest. There were also pyramidal symptoms, earlier cerebellar ataxia, gross nystagmus, failure of abdominal reflexes, scanning speech, etc. In the second case there were myoclonic symptoms limited to one-half of the body. Both of these cases revealed histologically the distinctive picture of multiple sclerosis. The third case is reported only clinically but without much doubt it belonged to en-

cephalitis epidemica. There were a mixture of tonic muscular tension, myoclonic twitches, athetoid and choreiform movements, also slight atrophy of one and temporary inactivity of the other optic nerve. This latter symptom has been observed in isolation in lethargica.

Bolten, G. C. A PECULIAR CASE OF MULTIPLE SCLEROSIS. [*Nederlandsch Tijdschr. voor Geneeskunde*, LXVII, August 18, p. 722.]

Bolten reports to the South Holland Neurological Society a peculiar case of multiple sclerosis in a man of thirty-four, in whom hardly any appreciable change has been noted during the last fourteen years. The case is also notable because throughout there has been radiological evidence that the sella turcica is rather wide and the sphenoidal sinus a little small, but yet there have been no signs pointing to either acromegaly or adiposo genital dystrophy. Bolten thinks this point renders very improbable the existence of a pituitary tumor; he mentions that Lhermitte has once seen a definite hyperplasia of the pituitary in multiple sclerosis. Bolten's case began fourteen years ago to have severe headaches, vertigo and vomiting; the only objective signs were a horizontal nystagmus and the slight enlargement of the sella. These symptoms disappeared and reappeared at intervals for fourteen years. Some weeks ago definite pallor of the temporal halves of the optic discs appeared, greater on the right, and the visual acuteness was now diminished in both eyes, more in the right. There was also a marked limitation of the peripheral field in the right eye with only very slight in the left. [Leonard J. Kidd, London, England.]

Gerson, M. ON THE ETIOLOGY OF MULTIPLE SCLEROSIS. [*Deutsch. Ztschr. f. Nervenheilk.*, LXXIV, 251. *Med. Sc.*]

Gerson has examined the condition of the tonsils and of the mucosa of the nasopharynx in eleven cases diagnosed as multiple sclerosis. In all of these he found lesions of the nasopharyngeal mucosa, and in ten of them pathological changes in the tonsils. The mucous lesions are described as including hypertrophic and atrophic rhinitis. The tonsils were either enlarged or atrophic and indurated, and in both instances contained pus. He suggests that the tonsils may be the port of entry of the virus responsible for the disease. He outlines the following course of events: chronic infection of the tonsils, perineural lymphatic spread up the sensory nerve filaments surrounding the tonsils to the central nervous system, and a secondary trophic lesion in the mucosa of the nasopharynx. Intercurrent diseases or trauma may be the immediately determining factors in an invasion of the nervous system along this channel. He also thinks it possible that occasionally other primary sites of infection may be productive of multiple sclerosis by the same process. Six cases of the series were subjected to operative procedure on the tonsils and nasopharynx to clear away the source of infection. In each

of these a transient initial increase of nervous symptoms was followed by pronounced betterment. [F. M. R. Walshe.]

Marburg, O. BRAIN TUMORS AND MULTIPLE SCLEROSIS. [D. Zschr. f. Nervhkk., LXVIII, LXIX, 27.]

Marburg reports six cases of his own which throw light upon certain facts gathered from the literature concerning multiple sclerosis. These facts relate to that form which represents a circumscribed lesion of the brain with general tumor-like symptoms, the picture being that of tumor of the motor region with Jacksonian attacks, etc., cerebellar pontine angle tumor. There is sometimes choked disc, sometimes not. Unusual difficulty therefore exists in differential diagnosis particularly since actual brain tumor under certain circumstances can simulate the picture of multiple sclerosis. It is not necessary that a meningitis serosa should be bound with the multiple sclerosis to cause the picture of the tumor. Furthermore inflammatory edema of the brain itself with localization in the brain of the multiple sclerotic foci may cause symptoms of pressure. Operative interference upon the basis of supposed tumor does not essentially influence the multiple sclerosis unfavorably. Yet in doubtful cases it is well to wait since experience teaches that the multiple sclerosis will not long remain hidden. [J.]

Stevenson, G. S. SPIROCHETE STAIN IN MULTIPLE SCLEROSIS. [Am. Arch. Neurol. & Psychiat., IX, 88. Med. Sc.]

Observations as to the occurrence, and absence, of spirochetes in the brain in cases of multiple sclerosis have from time to time been abstracted in this journal. The most recent observation was that of Schuster (Medical Science, 1922, VI, 133), who, using a modified Jahnke stain, claimed to have demonstrated an abundance of spirochetes in small fresh foci of disease. Jahnke's recent modifications of his method have made it a reliable indication as to the presence or absence of spirochetes, and the author has undertaken a fresh study of disseminated sclerosis from this point of view. Four cases presenting typical lesions were studied, and in no case was anything resembling a spirochete seen. Stevenson concludes that spirochetes are absent or infrequent in the brain in disseminated sclerosis, and if present cannot be demonstrated by the most reliable silver stains now available. [F. M. R. Walshe.]

Mann, L. TREATMENT OF DISSEMINATED SCLEROSIS. [Klin. Woch., December 3, 1922, p. 2573.]

L. Mann records the results in the treatment of eight cases of disseminated sclerosis with tetraphan, a derivative of atophan. He points out the great difficulty in estimating the value of drug treatment in disseminated sclerosis owing to the spontaneous improvement which often occurs, and to the occasional occurrence of periods in which the disease

is for the time latent. Also we have no means of definitely expressing and measuring the degree of many of the prominent symptoms. Notwithstanding these difficulties the author records eight cases in which improvement followed treatment with tetrophan. In three cases the results were prompt and marked, and consisted chiefly in a great diminution of the spastic paraplegia and great improvement in the gait. In five other cases similar but less striking improvement followed the use of the drug. In all of the cases the spasticity of the gait was diminished and walking became less difficult.

Wexberg, E. CONSTITUTIONAL DISPOSITION TOWARD SYRINGOMYELIA. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXIX.]

Wexberg refers to two cases of familial syringomyelia, reported by Karplus and Kreidl, and adds the cases of a father and son. He believes that the constitutional basis of the disease is further confirmed by the frequent association with it of other constitutional anomalies, *e.g.*, spina bifida. He gives also an example of this in a case of spina bifida in the cervical spinal column.

Brouwer, B. NEUROLOGICAL ILEUS. [Nederlandsch Tijdschr. voor Geneeskunde, LXVII, January 27, p. 406.]

Brouwer reports three cases of organic diseases of the nervous system in which occurred attacks of ileus without any detectable lesion in the alimentary canal. Two of these were cases of cervical syringomyelia with syringobulbia, the third was one of a spinal cord lesion, in the fourth cervical segment. In these cases there was a sudden appearance of acute ileus: obstipation, severe abdominal pain, swollen abdomen, visible peristalsis, nausea, and a bad general state with feeble pulse, etc. Abdominal operation revealed nothing wrong. The third case was especially interesting: A man of thirty-seven had for some weeks had pain in the neck and tingling in the fingers; in two days' time his upper limbs were paralyzed, and soon after also the lower limbs. He had diminished tendon jerks, Babinski reflexes, and loss of abdominal reflexes. There were sensory changes over the whole of the body up to the area of the third cervical segment, with all the signs of a complete transverse lesion at the level of the fourth cervical. Röntgenology showed great changes in the third and fourth cervical vertebrae. Then appeared acute ileus, but there was no pain, doubtless owing to the loss of pain condition. Operation was not performed, owing to the very bad general state and the advanced destructive changes in the two cervical vertebrae. Paresis of respiration soon supervened, and death occurred owing to failure of the function of the phrenic nerves. Necropsy showed a tumor of the third and fourth cervical vertebrae, and a lesion in the fourth segment of the cervical spinal cord. There was extreme distension of the intestinal walls, and the intestines were stretched and filled with gas.

Brouwer believes that these cases of what, in the absence of any abdominal lesion, he calls "neurological ileus" are to be attributed to sympathicus paresis. Seeing that important sympathetic centers exist in the cervical spinal cord especially, he thinks it probable that the ileus is the sequel of the cervical cord lesion. And that this sympathicus paresis in cases of syringomyelia can become worse, he interprets by the circumstance that in this disease repeated circulatory disturbances occur in the affected area, by means of which the other clinical symptoms alternate. [Leonard J. Kidd, London, England.]

Kooy, F. H. SYRINGOMYELIA. [Med. Journal of South Africa, February, 1922.]

Kooy reports an early case of syringomyelia on which it was possible to carry out a thorough post-mortem examination of the brain and spinal cord on account of the fact that the patient died of pneumonia while in the hospital. The symptoms had been headache and pain in the left shoulder; all the bones of the left side of the face were thickened and he had almost lost the sight of the left eye, and breathing through the nose was difficult; there was dissociation of sensibility on the left arm, left side of the neck, and left half of the face. At the necropsy the frontal, temporal zygomatic, and maxillary bones were all thickened on the left side, and the various sinuses had disappeared and been replaced by solid bone. Microscopically the ependyma cells round the central canal were thickened, and in the upper dorsal segments the lesion extended into the left posterior horn. For a short distance the glia cell accumulation was found in the left posterior tract, and in the upper cervical segments and bulbous the same process could be traced in the ascending fifth. The author is of the opinion that such a case as this throws light on the debated point as to whether the trophic changes which occur in syringomyelia are due to lesions of separate trophic nerves, or whether the trophic influence is a function of the nerve fibers and cells of motility and common sensibility. Since there were so few sensory lesions in the head, no clinical signs of affection of the cervical sympathetic, and the circulation appeared normal, and yet the trophic changes were so marked, the author concludes that these were due to lesion of the spinal fifth, the same center to which pain and thermic stimuli of the overlying skin are conducted. The fact that hyaline degeneration was present in the walls of the blood vessels of the cord in addition to glia proliferation lends support to the possibility that syringomyelia may be due to a chronic inflammation and not merely a congenital glia proliferation.

BOOK REVIEWS

Straus, Erwin. WESEN UND VORGANG DER SUGGESTION. [S. Karger, Berlin.]

This is Vol. 28 of the Bonhoeffer Abhandlungen and is a short, clearcut series of conceptions mostly made up of logical propositions and dealing at manifest content levels with the phenomena of that illy defined concept suggestion.

The author's tendency is to deal with the nature and process as something going on chiefly at conscious and intellectual levels in which the individual-social synthesis "I-Us" is dealt with quite differently from the standpoint of those who have come to believe that suggestion is best comprehended from the standpoint of the affectivity, is conditioned by the logic of the foreconscious and unconscious rather than by the rational logic of the intellectual activities. Thus of the phenomena of transference, which plays such a rôle in the libido-theory and of its relationship to suggestion, there is no discussion. Thus it seems to lack any foundation on psychopathological formulations save those of a purely intellectualistic school—Jaspers, for instance.

Roussy, Gustave. TITRES ET TRAVAUX SCIENTIFIQUES. [Masson et Cie, Editeurs, Paris.]

It is one of the most attractive features of French cultural activities, in the academic line at least, this of preparing a list of one's titles and a digest of one's scientific or other contributions when the goal of a professorship has been reached in a university faculty. Professor Roussy in 1924 was elected by his confreres to be professor of pathology and this attractive volume, following an old custom, is the result.

Thus one can trace his career from his initial externship in 1899, internship in 1902–1906—his doctorate in medicine in 1907, to his present point of significance and at the same time note the contributions to science—numbering 235 up to 1924. These are most ably given in résumé thus affording a coup d'oeil of Professor Roussy's many achievements.

We here congratulate him upon his appointment so well merited and take pleasure in calling attention to this volume which so ably attests his conspicuously valuable attainments.

Meyer, H. M., u. Gottlieb, R. DIE EXPERIMENTELLE PHARMACOLOGIE. Siebente neuarbeitete Auflage. [Urban und Schwarzenberg, Berlin u. Wien.]

Meyer and Gottlieb's Pharmacologie has been a classic now for some years, in fact from the appearance of the first edition 15 years

ago. From the first the outlook has been that pharmacology was viewed as an inherent part of biology. The action of drugs and their availability for the modification of pathological biological processes has been the goal constantly kept in view throughout, but one feature has distinguished this work and has been more and more prominently put forward, namely, that the nervous system is the integrating mechanism of all biological processes and therefore pharmacological action must be correlated with nervous system action in order to understand it in theory and thus rightly apply it in practice. Good theory and good practice are one. Practice without theory is an illusion. Bad theory always lies behind bad practice.

The general conceptions which lie at the foundation of all toxic action must be fundamentally sound and are so only when the nervous system components in action are properly appraised.

This is what makes this pharmacology of special interest to well grounded students of the nervous system. There is an enormous amount of "bunk" that passes as therapeutics. There is possibly no field in medicine where the earnest seeker after truth and reality is more often blocked than in the therapeutic field and in which more random groping is to be observed. We can earnestly commend this work as one that can lead to the straightening out of many therapeutic fallacies and misconceptions.

Schultz, J. H. TASCHENBUCH DER PSYCHOTHERAPEUTISCHEN TECHNIK. [Fischer-Kornfeld, Berlin.]

This small pocket manual of psychotherapeutic technique is an admirable compressed volume upon the utility and modes of using Hypnotherapy, Persuasion, Psychocatharsis and Psychoanalysis with an admirable short chapter upon the indications which should govern one's choice of the methods to be used according to the situation involved.

Smith, T. Waddelow. AN INTRODUCTION TO THE MIND IN HEALTH AND DISEASE. [William Wood & Company, New York.]

Should one wish to find a series of concentrated essences of White's "Outlines of Psychiatry" or of the same author's "Introduction to the Study of the Mind" it can be found in this excellent condensation. This is freely acknowledged in the author's Preface, which coming from Nottingham, England, is not without its significance.

Hoffmann, Hermann. FAMILIENPSYCHOSEN IM SCHIZOPHRENEN ERBKREIS. [S. Karger, Berlin.]

The appearance of this most interesting monograph—No. 32 of the Bonhoeffer Abhandlungen, once again calls our attention to the activity of Professor Gaupp's assistants in the Tübingen Clinic.

Kretschmer, Storch and Hoffmann have in recent years done much work of a most compelling nature and it is a pleasure to call attention to this excellent contribution to the general subject of heredity especially as applicable to the broad grouping envisaged as schizophrenia.

The details must be consulted in the original. A few general principles stand out and are emphasized by the author. We cannot recite all of them. In the first place his study accents the fact that a much clearer delineation of the schizophrenic reaction type is needed. To use the designation schizoid is not enough since many schizoids fail to show the characteristic reactions and further many schizoid family groupings fail to develop schizophrenics. Cyclothymic personality types may cover up schizophrenic possibilities and vice versa "pure schizoid schizophrenias" may show very marked circular syndromes. Thus the problems involved are of much greater complexity than are solvable by the hypotheses of Kahn and Rüdín—up to the present time—*i.e.*, by means of the genetic methods.

As already stated, a valuable contribution to the heredity problem in the psychoses and temperamental types.

Wittels, Fr. FREUD, L' HOMME, LA DOCTRINE, L' ECOLE. [Traduit par Mlle. L. C. Herbert. Felix Alcan, Paris.]

An excellent French translation of Wittel's book upon Freud—"as seen through a temperament," already reviewed in these columns, Vol. 61, 1925, 210, 330. Freud's most delightful letter, which appears in the English translations, is wanting in this edition.

Hesnard, A., et Laforgue, R. L'EVOLUTION PSYCHIATRIQUE. PSYCHOANALYSE-PSYCHOLOGIE CLINIQUE. [Payot, Paris.]

This is a collection of studies by French students of psychiatry oriented in the direction of the dynamic psychology, the chief activity of which has arisen from the impetus of Freud's work and the psychoanalytic school. At the same time there are here included studies by those who are antagonistic to the psychoanalytic doctrines—as conceived by them—and yet are not satisfied with the rigid systems which have been orthodox in French psychiatry.

It is quite doubtful whether any synthesis of French orientation towards psychiatric problems is possible at the present time. It may be recalled, historically, that such a placement was possible in Pinel's synthesis and in Esquirol's later elaboration of the same—but since Morel's plunge into the "degenerée" dogma—French psychiatry has had no generalizer of as compelling value, may it be said, as resulted from Kraepelin's work in German psychiatry. The different French schools never came to any synthesis, either as a dominating nationalistic attitude, or, as a frank acceptance of the Kraepelinian psychiatry.

Some effort at orientation is present in this volume and here psychoanalysis stands out as an issue.

The chapters themselves are of interest apart from the general viewpoints. This is specially true of the opening one dealing with the psychoanalytic movement in France. Here one sees reiterated what has happened in Germany, England, America, Italy and elsewhere. "All is nonsense, at least what is not nonsense, has been known for a long time, and finally, what is true, I said myself long ago." Jones has pointed out this formula for all new ideas. At first,

absolute rejection, then modified acceptance on the basis that everybody knew it was so, and finally, egotistical claims as to being the discoverer of the rejected doctrine—usually with a modified terminology—such as the egotisms of mankind. Excellent examples are seen in Janet and in some recent papers of McDougall.

A second paper records the partial conversion of H. Claude to the new ideas. Claude is a real person in French neuropsychiatry, but one has to be diplomatic in Paris as well as in other places in "University" circles.

One suspects from the third paper by de Saussure that here lay the disturbing ferment. As a personally analyzed individual by Freud, the author of one of the most lucid and direct works upon psychoanalysis, a worker for a time in Claude's psychiatric clinic in Paris, who with Allendy and Laforgue treated certain incorrigible cases, with good results, right under the chief's nose, and hence Claude's semi-reluctant acknowledgment that psychoanalytic treatment had done what no other methods had been able to do, *i. e.*, cure certain incorrigible psychoneurotic and mild psychotic individuals. Here certainly was the rub, but after all, sincerity and the gallic temperament prevailed and Claude came out like a gentleman and said "these things are true."

Little avails it to record the other papers, they are certainly worth reading, especially those of Laforgue, if the chief situation has obtained a foothold and from now on one can see that the psychoanalytic movement in France will obtain more and more allegiance.

Pitres, A., and Testut, L. LES NERFS EN SCHÉMAS. ANATOMIE ET PHYSIOPATHOLOGIE. [Octave et Gaston Doin, Paris.]

This large and beautifully illustrated octavo volume was born out of the war. Surgical necessities demanded constant instruction of surgeons concerning the wounds of war, particularly of the nervous system, without a knowledge of the intricacies of which cutting might be hazardous in surgical work.

Hence the charts and studies which have been here later condensed and brought into book form.

The work itself of 700 large octavo pages contains seven chapters devoted respectively to Some General Considerations, Cranial Nerves, Spinal Nerves, Sympathetic System, Nerve Centers, Corticospinal Paths, and Reflexes and Reflectivity.

The style is clear and the facts ample and in accord with recent research. The charts are beautifully executed in colors and are especially valuable for teaching purposes.

Dana, Charles L. TEXT-BOOK OF NERVOUS DISEASES. Tenth Edition. [Wm. Wood and Company, New York.]

The chief outstanding feature of this new edition of Dr. Dana's work is an introductory chapter on the History of Neurology by Dr. Garrison. It is a delightful and authoritative addition. This, with a chapter on epidemic encephalitis, constitute the new material; otherwise the work remains as it has been, an excellent textbook of the

dogmatic pedagogic type whose utility is unquestioned, living as it has through ten editions.

Tretiakoff, C., et al. MEMORIAS DO HOSPICEO DE JUQUERY. [S. Paulo Brasil, No. 1, Sao Paulo.]

This enterprising young neuropathologist, after leaving Marie's laboratory at the Salpetriere, where he first called attention to the importance of the lesions of the substantia nigra in epidemic encephalitis, obtained a position in the Juquery Hospital of San Paolo. This volume attests to his and his colleagues' activities there in the year 1924-1925, where he also was instrumental in organizing a neuropsychiatric society. The transactions of this society also appear in this interesting volume.

The chief papers are on neuroanatomical subjects. Fatty Plaques in Mental Disease, *Treponema pallidum* in Paresis, and *Cysticercus Cerebrale*, by Tretiakoff and Silva; Vascular Lesions in Manic-Depressive Psychoses, by Tretiakoff and Vieira; Amyotrophic Lateral Sclerosis, by Tretiakoff and Amorim—these are but a few of the interesting papers published here. A French translation is given of all the papers, thus offering an excellent pony for any interested in Portuguese.

Singer, Edgar Arthur. MIND AS BEHAVIOR AND STUDIES IN EMPIRICAL IDEALISM. [R. G. Adams & Co., Columbus, Ohio.]

The author is professor of philosophy in the University of Pennsylvania. From his Preface we gather he is one of those professors, grace a Dieu, who seems to be a human being and not an autocratic pedagogue, meaning by which latter a doctrinaire. We are attracted to him at once by this same humanistic preface, and furthermore his references to earlier English philosophers of the Clifford-Lewes school further predispose us in his favor.

We have always advocated that what is called "Mind" is only a special form of Behavior, and that a monistic point of view is thus attained, hence this author's viewpoint is very congenial to our own, and is a better type of thinking for the solution of neuropsychiatric problems than absolutism, or psychophysical parallelism, or other formulations in current philosophy.

Another thing we like is the author's easy armchair style, his high-brow stuff is all eliminated—at least up to page 101, when we run across some such sort of thing as this, $f.(r_1, r_2)$, and before we finish with the rest of the postulates about stimulus and intensity we wish he hadn't. Fortunately this Weber-Fechner digression about sensation-intensity with its quasi-mathematics only occupies a few pages. As when we read Einstein, we skip the mathematics.

Pain and Dreams is still quite naïve, patterned a bit upon Bergson's conceptions, but the author still is open to a deeper interpretation. Of Freud he seems to have no inkling.

And so, in various, more or less unconnected chapters he goes on, pleasing, stimulating and always interesting. Behavior is but one of the modalities of psychical activity and as such must be conceived.

Here is no scholastic effort to envisage the universe. Rather a

pleasing armchair series of conversations upon philosophical topics, not too closely related but nevertheless bearing upon a general goal that "man is the measure of all things" and, Protagoras-like, come let us reason together and see where we can arrive. To the reviewer a most delightful series of chapters.

Hillemand, Pierre. CONTRIBUTION A L'ÉTUDE DES SYNDROMES DE LA REGION THALAMIQUE. [Jouve et Cie, Editeurs, Paris.]

A conscientious and intelligent presentation of the general problems of the clinical and anatomical situations arising from lesions of the thalamic region. Stimulated by and working with Foix, these studies continue the excellent work begun by Dejerine and Roussy.

The chief accent is laid upon the vascular topography as giving rise to the particular type of syndromy. A complete chapter is devoted to the elaboration of this vascular topography which follows, with many anomalies, a more or less definite structuralization. He describes five arterial branches, the thalamoperforated, thalamo knee, premamillary, choroidian, and lenticulothalamic. Lesion of each of these gives its specific clinical features, here discussed, and of which two are taken up in detail as classically described by Dejerine and Roussy, especially the first form due to lesion of the "thalamo-genouille" branch, clinically recognizable by asynergia, forced contractures, and choreiform movements. A second syndrome essentially showing disorders of coördination, intention tremors, etc., is consequent upon a lesion of the thalamoperforating branches involving the thalamus and the anterior end of the red nucleus.

In a second part the sensory components are discussed in detail and furthermore posterior projecting involvements of the cuneus and splenium are taken up as related to the hemianopsia and the alexia and also endeavoring to analyze the mechanisms of intention tremors and hemichoreoathetoid movements, conceived as due to lesions of the cerebello thalamic pathways.

Meerburg, G. F. Gezelle. BIJDRAGE, NAAR AANLEIDING VAN EEN ANATOMISCH EN GENEALOGISCH ONDERZOEK TOT DE KENNIS VAN DE CHOREA HUNTINGTONEA. [Door Vonk et Co., Zeist.]

From this very complete Doctorat Thesis from the University of Utrecht much can be gained concerning Huntington's Chorea.

The author first gives an extremely valuable historical résumé of the genealogical studies and then of the anatomical studies of this bizarre syndromy in about fifty-five pages. Then follows a detailed description drawn from serial sections of a brain from Professor Winkler's clinic.

The genealogical charts of five families are then presented with detailed descriptions of all of the members. Finally the author closes with a discussion concerning certain questions, in which Meerburg lays particular stress upon the suicidal tendencies of these patients, upon alcoholic retreats, upon accidental traumata, and upon other psychoses. A series of conclusions and a bibliography conclude the work.

Very briefly the chief accent laid upon the anatomical substratum shows implications of the small cells of the third layer of the frontal, central, and temporal convolutions of the cortex and the small cells of the nucleus caudatus, the putamen, and nucleus lentiformis. The cells of the globus pallidus, substantia nigra, and cells of Clarke's columns did not escape. Genetically speaking, the author is inclined to follow Davenport's conception of a biotype form of inheritance. The work of Entres was apparently not available.

The whole makes a very useful and serious contribution to the study of Huntington's chorea.

Kahn, Eugen. HANDBUCH DER PSYCHIATRIE. ERBBILOGISCHE EINLEITUNG. [Franz Deuticke, Leipzig u. Wien.]

We have called attention to the fact that Aschaffenburg has taken up the continuation of this valuable Handbuch der Psychiatrie which was interrupted by the World War.

A number of monographs have appeared as continuation, among which this one of Dr. Kahn's is of special interest. As a pupil of Rüdin's he is specially qualified to discuss the heredity problem as applied to the psychoses.

Everyone knows, *i.e.*, everyone who has paid any special attention to the problem, that in the human being heredity problems have become extraordinarily complicated. Even in the banana fly, Morgan has had to make hypothesis after hypothesis to envisage the phenomena, and *Homo Sapiens*, phyletically speaking, is a long way along from *Drosophila*—meaning the banana fly.

Fortunately Kahn is not blind to this general situation, even though a trifle myopic, and hence we find in this contribution a well rounded discussion from which one cannot emerge, after reading, without a definite sense of having gained something, even if a final solution has not been given. In point of fact there is no such fortunate solution in a relational world, but Kahn's contribution possesses the very best criteria of honest, sincere, persistent, and intelligent utilization of the available criteria at the present time.

In short, he gives us a study which is worthy of its companions in this valuable "Handbuch."

Saito, T., Takahashi, K., and Uyematsu, S. ORIENTAL BULLETIN OF NEURO-BIOLOGY AND JAPANESE JOURNAL OF NEUROLOGY AND PSYCHIATRY. [Tokio, Japan.]

These two new neuropsychiatric journals have been founded in Japan. Both utilize the English language and contain many interesting articles of value to American students.

In the opening number of the Bulletin, Saito has an extremely detailed and valuable study upon the structural changes following upon nerve fatigue following Hodge's initial investigations. While in the Journal there are six original studies and some fifty-eight abstracts of Japanese work in neuropsychiatry of much interest.

We commend these two new series to our readers. They are published at \$1.00 and \$1.50, respectively, and can be obtained from Professor Saito, 1441 Asamadai Shinagawa, Tokio, Japan.

OBITUARY

SANTE NACCARATI

Dr. Sante Naccarati, who had been proposed for membership in the American Neurological Association in June, 1926, by Doctors Zabriskie and Osnato, was killed as a result of an automobile accident on the Sulmona-Scauro Road near Bugnara, Italy, on August 14, 1926, and died the next day in the hospital at Sulmona from a fracture at the base of the skull.

Dr. Naccarati was born on March 5, 1887, in Viesti, Italy. He was single and a graduate in medicine from the Royal University of Naples in July, 1912.

Dr. Naccarati did much post-graduate work in the University of Rome and in Columbia University in New York. He received the degree of Doctor of Natural Sciences from the University of Rome in June, 1920, and the degree of Doctor of Philosophy at Columbia in July, 1921. About two years after his graduation he came to New York City and practiced neurology at various intervals up to the time of his death.

Among his more important publications are the following:

Obsessions and Fixed Ideas. *Neurological Clinics*, 1918.

Hormones and Emotions. *Medical Record*, May 28, 1921.

The Morphologic Aspect of Intelligence. *Columbia University Contributions to Philosophy and Psychology*, Vol. 27, No. 2, 1921.

Contribution to the Morphologic Study of the Thyroid Gland in *myoeuropaea*. *Jour. of Morphology*, 36, 2, March, 1922.

On the Relation Between the Weight of the Internal Secretory Glands and the Body Weight and the Brain Weight. *Anatom. Record*, 24, 4, November, 1922.

Influenza della tiroidectomia sul ritmo cardiaco. *Archivio di Fisiologia*, 21, 5, September-October, 1923.

The Relation of Morphology to Temperament (in collaboration with H. G. Garrett). *Jour. of Abnormal Psychology and Social Behav.*, 19, 3, October, 1924.

Verso una psicologia costituzionale. *Rivista critica-sintetica sulle correlazioni somatico-psichiche*. *Endocrinologia e Patologia Costituzione*, January, 1926.

Vegetative Disturbances in Epidemic Encephalitis and Their Relation to Mesencephalic and Diencephalic Lesions. *Changes in Basal Metabolism*. *JOURNAL OF NERVOUS AND MENTAL DISEASE*, Vol. 63, No. 3, March, 1926.

At the time of his death Dr. Naccarati had ready for publication the following manuscripts.

Alcune considerazioni su di un caso di Encefalite epidemica presentante una insolita sindrome neuro-endocrina.
Correlazioni antropologiche volumetriche e segmentali nell' uomo in diverse età. Contributo biometrico allo studio della crescita.
Translation of "Le Debolezze di Costituzione" by N. Pende.



DR. SANTE NACCARATI

Besides contributing to periodicals devoted to nervous and mental diseases in this country and in Italy, Dr. Naccarati has contributed valuable papers on the natural sciences. He was associate professor of nervous diseases in the New York Post Graduate Medical School and Hospital and associate attending physician at the Neurological

Institute. Within the last two years he had become a Private Docent in Neuropathology in the University of Rome.

Dr. Naccarati was loved and respected not only for his scientific attainments but for his amiable personality and his cultural, thoughtful qualities.

He is survived by a brother, Girolamo, who lives in Rome, Italy.
[M. OSNATO.]

FREDERICK WALKER MOTT

By the death of Sir Frederick Mott, K.B.E., M.D., F.R.C.P., F.R.S., LL.D., which occurred on June 8, 1926, the neuropsychiatric world has lost one of its most illustrious figures. Dr. Mott was seventy-two years of age and died of cerebral hemorrhage.

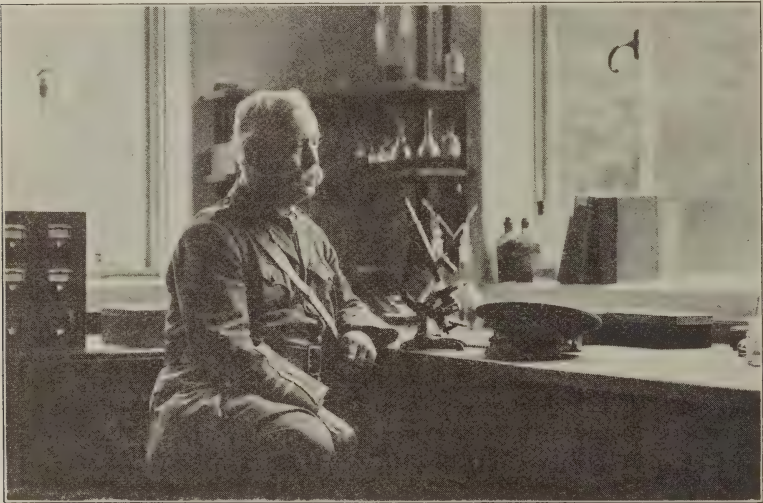
He was born in Brighton, England, on October 23, 1853, the son of Henry Mott, and was interested early in medical work. Before entering upon his medical studies at the University College Hospital he was a pupil at the Royal Sussex County Hospital, Brighton. He attracted no particular attention as a student, being of the solid, slow and sure type rather than the quick assimilative kind that often carry off examination honors, yet his honors were high when he passed his M.B. degree at the University of London in 1881, taking at the same time his B.S. degree. In 1886 he took his M.D. degree, having studied pathology in Vienna, physiology with Schäfer in London, and where he did some excellent histological work on the cells of Clarke's columns. In 1883 he was made an assistant professor of physiology in Liverpool and later lectured in physiology in the Charing Cross Hospital Medical School, later made registrar there and later lecturer in pathology.

His interest in the nervous system was evident from the first and this combined with his pathological work led him to the directorship of the pathological laboratory at Claybury which was a clearing house for the London County Asylums. Here he carried on his really famous work on the pathology of mental disorders. He kept in touch with all of the current work in internal medicine, retaining his position at the Charing Cross Hospital but it was made contributory to his central interest, psychiatry.

Maudsley had been his psychiatric father and he carried on the Maudsley traditions and never divorced body and mind which was the custom in most minds. While at Claybury he started his Archives of Neurology and Psychiatry which contains his own as well as the work of those whom he stimulated.

Mott soon gained an international reputation. He was one of the few English psychiatrists in touch with continental psychiatry, especially the work of Kraepelin, whose Munich Clinic, Mott himself has written, had no counterpart in England. He sought to make the Maudsley Hospital such a clinic, but the World War interrupted his plans.

No adequate presentation of his many researches can be given here. His work was of the rigidly scientific order. Beginning with the anatomy and physiology of the nervous system he went on to the pathology and then applied this knowledge in his clinical studies. While with Schäfer, he contributed important work on cerebral



SIR FREDERICK MOTT AT HIS LABORATORY IN MAUDSLEY HOSPITAL

localization and the motor functions of the cerebrum, and later he worked with Sherrington on the sensory cortex, including the well known experiments on the anesthetic limb. Research on the functional activities of the spinal cord followed. He made important contributions to the histology of the nervous system, showing among other things the thalamic connections of the fillet. His appointment as pathologist to the central laboratory of the London County Asylums gave him a unique opportunity for the study of the pathology of mental disorder which he turned to good account. Krafft-Ebing had announced the syphilitic origin of paresis, but his views received little support in England until, on the basis of an immense amount of clinical and pathologic evidence obtained in his laboratory, Mott removed all doubt as to the syphilitic origin of the disease.

Another subject on which he made important studies was dementia precox. He showed the widespread bodily changes that take place and brought forward pathologic evidence of a congenital origin of the disease. A study of the immense material furnished by the London Mental Hospital led him to formulate the "law of anticipation" in insane stock, according to which the psychotic factor appears earlier in each succeeding generation. This he regarded as an effort of nature to eliminate the tainted stock, more important than segregation or sterilization, as the period of greatest fertility precedes the development of those symptoms which would bring the person under control. During the war he acted as a neurologic consultant to the army, which led to a study of the war neuroses. He found that in the great majority there was previous nervous instability. This led him to the important conclusion that the strain of war was an effective cause of neurosis only in those of neuropathic disposition. His work on the effects of high explosives on the central nervous system was of the first importance. He was also able to show that "shell shock" cases can be divided into two great classes: a few cases in which there actually has been a shock and in which tiny hemorrhages into the brain substance can be seen; and a large number of cases in which unfit men break down under the stress of war and in which no actual shock has, as a rule, taken place.

These two aspects of Mott's work, in which he exercised a paramount influence and did so much to further the progress of psychiatry, are so closely interrelated that they may be conveniently considered together. With Mott as director, the Claybury Laboratory soon began to attract a number of enthusiastic workers from this country and abroad. Many well known psychiatrists and neuropathologists began their careers under his guidance, and he stimulated research in mental disorders in a way that had hitherto been impossible. Many of the medical officers became interested in clinical psychiatry as a result of his visits to the various asylums; no systematic instruction had hitherto been given, and the medical staff of these institutions had to gain a knowledge of psychiatry as best they could and without much encouragement to do so. In the preface to the third volume of the *Archives of Neurology* (1907) Mott made a strong plea for the development of a psychiatric institution on lines similar to that at Munich. His ideal was a fully equipped and well organized psychiatric clinic, under the control of a university, in which early and curable cases could be treated without certification. He suggested also that if suitable post-graduate training in psychiatry were established the universities and licensing bodies might be induced to establish a diploma in psychological medicine. As far as London

is concerned, his wishes have been realized, and that this is so is largely due to his incessant efforts since this article was published. Psychiatry owes him an immense debt of gratitude for throwing all his weight and influence into the furtherance of these projects. Shortly after this article was published, Maudsley offered £30,000 to the London County Council if it would build a hospital in London for the study and treatment of mental disorders in their early and curable stages. It was not until 1912, however, that the present site of the Maudsley Hospital was purchased and the plans were drawn. The hospital was only partially completed when the war broke out. King's College Hospital, which is on an adjoining site, formed the 4th London General Territorial Hospital, upon the staff of which Mott served in the rank first of major, afterwards as brevet lieutenant-colonel, as neurological specialist. The Maudsley Hospital was opened for neurological cases early in 1916 as a part of the 4th London General Hospital. The laboratory at Claybury was dismantled and the equipment transferred to the more convenient laboratory at the Maudsley.

The Maudsley Hospital soon became widely known, and successive groups of American officers were sent there for training in the treatment of the war neuroses. Many of these have spoken with gratitude of Mott's training, and also of his personal kindness, for he was extremely hospitable, welcomed them to his country, and entertained them in his house in London. Several distinguished foreigners who were driven from their country were also enabled by grants from the Medical Research Council to work in the laboratory. In 1919 the hospital was transferred to the Ministry of Pensions, and Mott, under the auspices of the London County Council, started a course of instruction for graduates, especially for asylum medical officers, to enable them to pass the D.P.M. of the University of Cambridge, which had been established just before the war. Mott was shortly afterwards gratified by seeing his wishes fulfilled by the establishment of a D.P.M. by several other universities and by the Royal Colleges—an innovation for which he was himself largely responsible. Thus were started courses of lectures at the Maudsley which opened up a new vista for the medical officers in mental hospitals. The value of these lectures has been very great. Both in London and the provinces there are now a large number of keen and well equipped medical officers who are in a position to take quite a different attitude towards their work than was possible in former days, and who are psychiatrists in the full sense of the term.

It might be supposed that when Mott resigned his position in the service of the London County Council in 1923 he would have relaxed his energies. This was not the case, however, and he threw himself unsparingly and with undiminished zeal into other activities. He continued to lecture at the Maudsley Hospital, and was director of medical studies there at the time of his death. He undertook a great task at Birmingham, where his services were eagerly welcomed both by the university and the city council. It speaks volumes for his driving power and influence that he was able to accomplish so much in so brief a time. He accepted the position of lecturer on morbid psychology at the university, and, with his advice, a joint board of research of the university and corporation of the city of Birmingham was established with a well equipped central laboratory. At the time of his death he was actively directing important researches at the Hollymoor Mental Hospital laboratory. Recently he had been engaged in studying by histological methods the effect of veronal and its cogeners on the central nervous system, and had, we understand, already obtained some important positive results. It was evident from some remarks he made at the annual meeting of the Royal Medico-Psychological Association, of which he was the president this year, that he visualized in Birmingham a clinic for early mental cases on lines similar to those followed at the Maudsley Hospital.

Mott's interests were numerous and varied. He was especially attracted to music, and was associated with societies interested in its cultivation. He was the author of an excellent little book, *Brain and Voice in Speech and Song*. He was kind, hospitable, and very human. He was in no sense remote from real life; he was a part of the busy world around him, and entered with equal zest into his researches, his recreations, and his social life. He had the simplicity and lack of affectation of the really great man, and no one could have been more friendly or accessible to the younger members of the asylum medical service than he was. Those who served under him regarded him with great affection, and the expressions of regret and tributes of admiration which he received upon his retirement from those who were, and had been associated with him during his long service with the London County Council abundantly demonstrated the esteem and affection in which he was held. Sir Frederick is survived by Lady Mott and four daughters. [J.]

NOTES AND NEWS

The Third Scandinavian Neurological Congress was held in Oslo on September 17 and 18. After the election of President (Professor Monrad-Krohn) and Vice-Presidents (Professors Marcus, Hagelstam, and Viggo Christiansen) reports were read by Borberg and Saethre on neurosyphilis, the first day being entirely devoted to reports and communications regarding this topic. Of great interest was a short communication by Dahlström, stating that metalues was exceedingly rare among patients treated according to the principles of the late Professor Boeck of Oslo (an anti-mercurialist).

On the next day various topics were dealt with: Gundersen (Oslo) raised the question of a possible close relation of epidemic encephalitis to epidemic parotitis. Based on epidemiological observations in Norway he demonstrated the probability of a very close connection between the two diseases. Ventriculography and cerebral operations were also subjected to interesting discussions (Antoni, Olivercrona, Magnus, Monrad-Krohn). Professor Henschen discussed the physiology of binocular vision and in another communication pleaded the necessity of assuming *an agraphic center*. Hansen related observations of a disease which he considered to be identical with Huntington's chorea and claimed that this disease had been observed and described by a local practitioner in Norway long before Huntington. Further interesting communications were made by Hagelstam, Marcus, Wohlfahrt, Thjötta, Winther, Höglund, Wernoe, Jørgensen, Sahlgren and Nylen, Kahlmeter and Bruusgaard.

Finally it was decided that the Fourth Scandinavian Neurological Congress should be held in Helsingfors in 1929.

We regret to announce the death of Professor E. Kraepelin. He died October 7, 1926, of a cardiac disorder. Fuller notice will appear in a later issue of the JOURNAL.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

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ORIGINAL ARTICLES

THE CIRCULATION OF THE CEREBROSPINAL FLUID FROM THE STANDPOINT OF INTRAVENTRICULAR AND INTRASPINAL THERAPY

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The problem of intraventricular and intraspinal therapy is intimately related with the question of the circulation of the cerebrospinal fluid. It is probable that a drug introduced in the spinal subarachnoid spaces follows the same path of absorption as the cerebrospinal fluid itself. The possibilities of a drug reaching the neutral nervous parenchyma are then the same for the medicament as for the cerebrospinal fluid. In order to estimate these possibilities we must briefly take into consideration various experiments demonstrating the circulation and absorption of the cerebrospinal fluid.

Magendie was the first to describe movements of the cerebrospinal fluid, particularly the circulation from below upward towards the ventricular cavities. After the confirmation of this view by Frank and Mosso, Key and Retzius called attention to the continuity of the cerebral and spinal subarachnoid spaces. This continuity has been confirmed by Quincke and by many other authors.

Do the subarachnoid spaces communicate freely with the ventricular cavities? Does the fluid flow freely from one to the other? The question is of great importance, as the problem of intraventricular and intraspinal therapy is based upon it.

Authors are divided chiefly into two groups, one of which believes

in such a free communication by the way of special foramina: the foramen of Magendie and the two foramina of Luschka. The first foramen was described by Magendie in 1825, although its presence according to Sterzi was already mentioned by Aller in 1762 and Cotugno in 1770. According to Retzius this foramen is quite constant, being lacking in only 2 per cent of the cases. The foramina of Luschka on each side of the former have been found by Hess in 51 cases of 54 examined.

While the majority of authors admit the existence of these foramina (Key, Retzius, Sappey, Schwalbe, Testut, McSee, Hess, Sterzi, etc.), others, such as Renault, Cruveilhier, Krause, Virchow, Reichert, Kölliker, Cannieux, and recently v. Monakow and F. Coupin, deny the existence of any preformed communication.

Leaving this matter still an open question, we may refer to the studies of L. Weed and Dandy and Blackfan, who believe that at least osmotic changes take place between the fluid of the two systems. F. Coupin contradicts this, although it must be remembered that Weed has described two areas of ependymal differentiation, superior and inferior, situated on each side of the midline in the roof of the fourth ventricle. The superior area of each side disappears soon, while the inferior remains as a functioning membrane which would allow the flow of the cerebrospinal fluid from the ventricular cavities towards the subarachnoid spaces. Such areas would furnish osmotic communication even in the absence of the foramina of Luschka and Magendie.

Investigators who deny the existence of free communication and believe that the fluid is secreted into the ventricles put themselves under obligation to explain the presence of the fluid into the subarachnoid spaces of the central nervous system. To understand this, the origin of the cerebrospinal fluid must be considered. We shall not review here all that has been written by the different authors to sustain their own points of view as to the origin of the cerebrospinal fluid. We shall, however, recall the crucial experiments of Weed and Cushing, who demonstrated that after experimental occlusion of the third ventricle, cerebrospinal fluid still accumulated in the lateral ventricles of the brain. They concluded that this fluid must be secreted by the choroid plexus. According to the pharmacological experiments and histological studies of Cavazzani (1901), Cappelletti (1901), Petiet Girard (1902-03), Francini (1907), Meek (1907), Pellizzi (1911), Hworostushin (1911), Ciaccio and Scaglione (1913), the choroid plexuses have a secretory function. We shall not undertake a critical study of the experimental procedures used by the

different workers, but may say that at present the consensus of opinion is that the cerebrospinal fluid is secreted by the choroid plexuses. Whether the complete fluid is secreted or only some of its components is still a question, though we may recall that Cushing and Blackfan reported a great diminution in amount of the fluid after removal of the choroid plexuses from the lateral ventricles.

Other investigators hold that the cerebrospinal fluid is a transudate, although they have not yet been able to explain the chemical differences between the cerebrospinal fluid and the blood plasma. The striking differences are in the albumin, sugar and urea content, the H ion concentration and the freezing point (Cavazzani, Weigeldt, Bisgaard, Palany, Ascoli, Bottazzi, Stern, Gautier, etc.). Another objection is the fact that venous stasis does not provoke an increase in the outflow of cerebrospinal fluid (Stursberg, Neu and Herman, Kafka, Frazier and Peet). Other authors, however (Bier and Wohlgemuth, Szecei and Weigeldt), state that venous stasis does bring about an increase in the outflow. Such an increase, according to Becht, is only apparent, due to a mechanical displacement of the fluid already present in the cerebral cavities, caused by the increased volume of the congested venous system.

Finally another important objection of a biological nature to the transudate origin of the cerebrospinal fluid is the fact that while the lymph contains the same antibodies that are present in the blood plasma, these antibodies are not present in the cerebrospinal fluid (Sicard, Pick, Köhler, Ciuca, Stern and Gautier, Bieling and Weichbrodt) unless the meninges are themselves affected by the pathological process (Weil-Kafka, Hauptmann, Vincent, Combes, etc.).

The dialytic origin of the cerebrospinal fluid is sustained by Mestrezat, who bases his assertion on the isotonia of the blood plasma and cerebrospinal fluid. Lange also considers the cerebrospinal fluid of the same nature as blood plasma, containing a colloidal part and a cellular part. The albumin in the cerebrospinal fluid, according to him, is the result of the disintegration of the so-called "Rundzellen" (which are of endothelial and not of hematogenous origin).

Pedrazzini claims that the cerebrospinal fluid is the transudate of small arteries. Finally some authors believe that the cerebrospinal fluid has a double origin, being partly secretion of the choroid plexuses and partly transudate (Schmidt, Schmorl, Dandy and Blackfan, Sterzi, etc.).

Another point to establish is the chemical composition of the ventricular fluid and of the fluid contained in the subarachnoid spaces. This might indicate an independence of the fluids. Schmidt was the

first to show that sodium and potassium were present in greater concentration in the ventricular fluid than in the subarachnoid fluid. Cushing, Mott, Weed, and others demonstrated differences in the chemical composition of the two fluids. According to Cestan, Risier, and Laborde, the chemical composition of the two fluids is as follows:

Subarachnoid Fluid	Ventricular Fluid
Total albumin, 30 mg. per 100 c.c.	10 mg. per 100 c.c.
Globulin; slight opalescence	Faint opalescence
Sugar, 45 mg. per 100 c.c.	65 mg. per 100 c.c.
Urea, 25 mg. per 100 c.c.	25 mg. per 100 c.c.
NaCl, 730 mg. per 100 c.c.	730 mg. per 100 c.c.
Lymphocytes, 3 cells per cmm.	0.1 per cmm.

Even the pressure of the two fluids is different. According to Weigeldt the pressure in the large cerebellar cistern is 82 millimeters of water; that in the lateral ventricle is 103 millimeters. Pathological findings also sustain the differences in the fluids. Schmorl, in 7 out of 10 cases of icterus, found that the ventricular fluid was unstained, while the subarachnoid fluid was a yellowish color. In 6 cases out of 7 he found that the Wassermann reaction which was positive in the subarachnoid fluid was negative in the ventricular one. The same results of the Wassermann reaction have been confirmed to some extent by Kafka, Solomon, and Welles.

These differences in the behavior and composition of the cerebrospinal fluid are emphasized by workers who believe in a lack of free communication between the two fluids. To explain the presence in the subarachnoid spaces of the fluid originating in the ventricles, the views of Monakow and his school must be recalled. On the basis of histological and embryological studies, Monakow denies the existence of the foramina of Luschka and Magendie, considering them as artefacts. According to him, the ventricular fluid traverses the entire brain parenchyma from the ventricular cavity to the subarachnoid spaces by way of the perivascular spaces first described by Robin (1858) and by His. These perivascular spaces, erroneously called lymphatic spaces, surround all the blood vessels down to the finest capillaries, and are known as the His channel and Virchow-Robin channel, the first of which is external and the other internal to the vascular adventitia (Fig. 1). According to v. Monakow, the cerebrospinal fluid contains colloidal material for the nutrition of the nervous elements. These are reached by flowing through the ependymal layer of cells and along the perivascular channels of His connected with the pericellular or perineuronal spaces. The waste products of the cellular metabolism which are soluble in the fluid

follow the same channel and are evacuated into the subarachnoid spaces of the brain. The solid material of catabolism and the waste products of cellular disintegration, as well as the scavenger cells, fol-

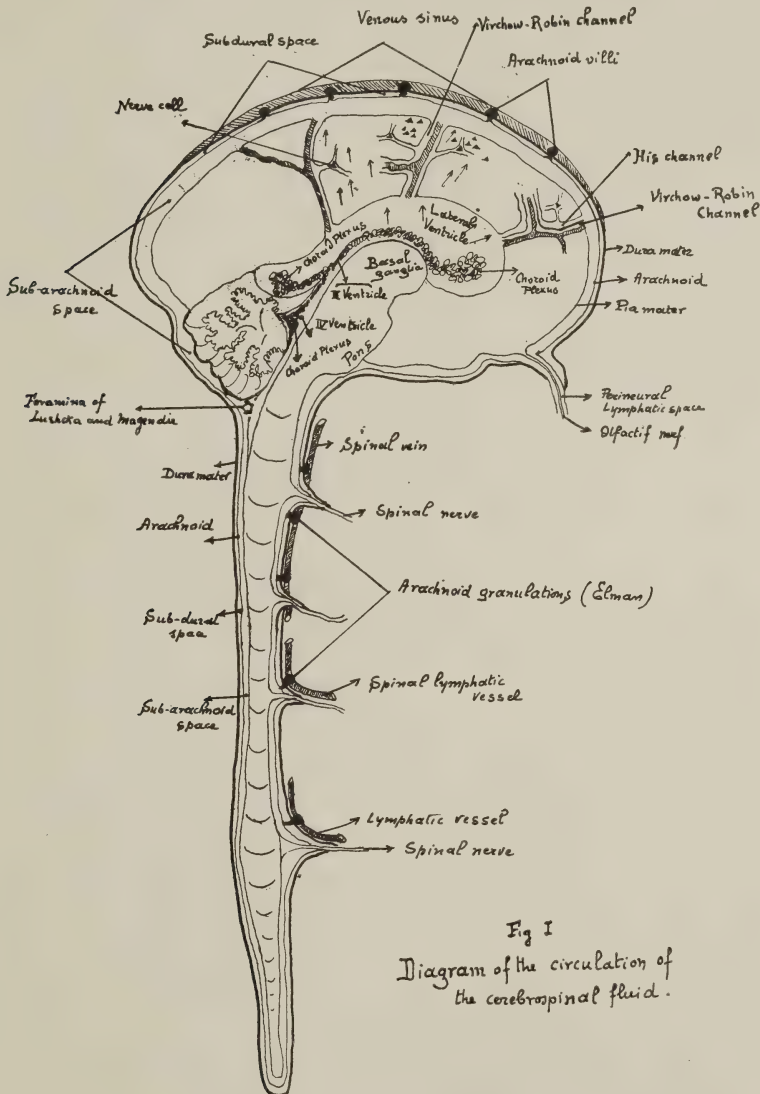


Fig I
Diagram of the circulation of
the cerebrospinal fluid.

low the Virchow-Robin spaces, whence they are discharged into the lymph channels of the meninges and into the general lymphatic circulation. Fig. 1 is a diagram by Weed to show the relationships

between the pericellular, the pericapillary, the perivascular spaces, and the subarachnoid spaces of the brain.

To this new hypothesis of v. Monakow, which is sustained by Stern and Gautier, Allende Navarro, and Minkowski, the following objections are made by Weigeldt: 1. The unfavorable conditions under which such a stream could penetrate the thick mass of nervous tissue. 2. The function of the ventricular epithelium, which is a membrana limitans rather than permeable filter. 3. The existence of the Held membrane, which makes of the brain a closed system. 4. Hydrocephalus following occlusion of the third ventricle, which should not be present if the absorption could take place through the nervous parenchyma. These objections, however, do not seem to us strong enough to exclude at least a partial current in the direction specified by v. Monakow.

Without rejecting this hypothesis, we may question rather the real efficiency of such a stream, its rapidity, and whether it represents the only way of exit of all the ventricular fluid. The first objection raised by Weigeldt can be ruled out because the ventricular pressure, which, according to his own views, is higher than the pressure of the subarachnoid spaces, would favor the penetration of the ventricular fluid through the ventricular epithelium and the nervous parenchyma.

The second objection, that the ependyma is a membrana limitans may be ruled out because experimental results of some investigators show that the ependymal cells lining the ventricles have some absorptive power. Klestaadt was among the first to demonstrate the absorptive power of the ependyma, following in this line of research the already suspected absorptive function of the choroid plexus (Loeper, Pellizzi, Goldman, Askanazy, Dustin, De Harven, Hassin, and Weigeldt). Wislocki and Putman have also found absorption by the ependyma cells in experimental hydrocephalus as to say in conditions of increased intraventricular pressure, while Weed and Foley admit that the ependyma can absorb when the introduction of the dye in the ventricle is preceded by an intravenous injection of hypertonic salt solution. Nañagas, however, claims that the absorptive power of the ventricular epithelium also is detected under normal conditions of pressure.

Peterhof, in a recent and careful study of the subject, has reached the conclusion that the passage of the foreign bodies into the ventricular lining epithelium and into the choroid plexus is not a vital function but the result of post mortem changes. If the fixation of the material is delayed for even one hour the particles of the dye penetrate as the result of artefacts into the ependymal epithelium.

On the other hand the passage of the ventricular fluid into the nervous parenchyma through the intercellular ependymal spaces described by many investigators is a great possibility (Renaut, 1899; Obersteiner, 1901; Studnicka, 1901; J. Sundwall, 1917).

To the last objection, that hydrocephalus follows the occlusion of the third ventricle, it might be answered that hydrocephalus may partially at least be the result of an overproduction of fluid due to venous stasis and generalized circulatory disturbances. On the other hand it must be remembered that Dandy and Blackfan after occlusion of the aqueduct of Sylvius have demonstrated that the absorption of the phenolsulphonephthalein introduced into the ventricles does take place although in reduced amounts.

* * * * *

We have reviewed the different pathways followed by the cerebrospinal fluid in its circulation in the cerebrospinal cavities. According to those admitting the existence of the foramina of Luschka and Magendie the fluid formed in the ventricular cavities passes by the way of these to the subarachnoid spaces. According to the school of v. Monakow it is through the whole nervous parenchyma that such a communication is established. Keeping in mind the main ideas of the circulation of the cerebrospinal fluid in the intracerebral and extracerebral cavities we may point out its application in treatment. We may then review the possibility of a medicament introduced into the ventricles or subarachnoid spaces to reach the nervous parenchyma.

This flow of fluid generally admitted by proponents of natural foramina Luschka and Magendie is directed from above downward, that is from the ventricular cavities into the subarachnoid spaces. This opinion was advanced by Key and Retzius and Propping. But these authors thought that there was a valvular system at the level of the foramina which prevented the reflux of fluid into the ventricular cavities. Such a valvular system was later denied by Dandy and Blackfan although they admitted the existence of a descending stream from the ventricles toward the subarachnoid spaces. They found that after introduction of phenolsulphonephthalein into the cerebral ventricles the dye was seen in the subarachnoid spaces within a period of one to seven minutes. At present the existence of such a descending current is admitted by the majority of the authors (Quincke, Ahrens, Lafora, Prados Such, Stern and Gautier, etc.). According to Cestan, Risier and Laborde, however, the introduction of a solution of neutral red into the occipital pole of the lateral ventricles is only slowly followed by the passage of the dye into the subarachnoid fluid. Only very small amounts were recovered after

two to three hours. These authors are then inclined to believe that normally the ventricular fluid passes very slowly into the cerebral and cerebellar subarachnoid fossae. The rate of outflow is increased if fluid is withdrawn simultaneously from the spinal subarachnoid space.

The ventricular fluid is not only directed from the ventricles toward the subarachnoid spaces but from the cerebral ventricles toward the central spinal canal. Quincke and later Ahrens have found the dye present in the lumbar portion of the spinal cord following its introduction into the cerebral ventricles.

Another direction followed by the cerebrospinal fluid is an ascending one directed from the spinal subarachnoid spaces toward the cerebellar fossa and the cerebral ventricles (Quincke, Ahrens, Dandy and Blackfan, Nañagas, Solomon, Thompson and Pfeiffer). Recently also Marinesco and Draganesco have found dye particles in the choroid plexus, the cerebral ventricular epithelium, and the subependymal tissue when introduced into the subarachnoid spaces of dying patients.

Against the ascending flow of the spinal fluid are however the data of Stern and Gautier, who believe that the normal direction of the fluid is from above downward and that only under high pressure can the dye introduced into the spinal subarachnoid spaces reach the ventricular cavities. Cestan, Risier and Laborde, on the other hand, are of the opinion that an ascending current may be provoked by the withdrawal of a certain amount of cerebrospinal fluid (say 30 c.c.) previous to the introduction of the dye. Weston also believes that under normal conditions a dye introduced into the spinal subarachnoid spaces fails to reach even the cerebellar reservoir. Bungart and Weigeldt have reported cases of spinal trauma in which the spinal fluid was hemorrhagic while the ventricular fluid was clear. These facts do not seem to us to weigh heavily against the existence of an ascending stream considering that the corpuscles might have reached the bottom because of gravity even against a moderate ascending stream. Undoubtedly in all these experiments attention must be paid to the fact emphasized by Solomon, Thompson and Pfeiffer that even in the presence of a supposed ascending current we must determine to what extent the dye is disseminated by diffusion and specific gravity. An ascending current is believed also to exist in the central spinal canal. Kramer claims that stained material reaching the central spinal canal travels upward. This stream, according to his view, is due to the vibratory movement of the ciliated ependymal cells. The possibility of the existence of such a stream in the central

canal is of interest in the spread of pathological processes from the spinal cord to the brain.

To establish the existence of flow in the central canal we must first elucidate two points, namely the existence of a free central canal and the possibility of a dye introduced in the subarachnoid spaces, reaching the central canal through the spinal nervous parenchyma. Some authors admit the existence of the central canal in the adult life (Bidder, Wagner, Schroeder, Kolk and Stilling), while others have found frequent partial obliterations especially in the cervical region (Kölliker and Clarke). On the other hand, Fronman in

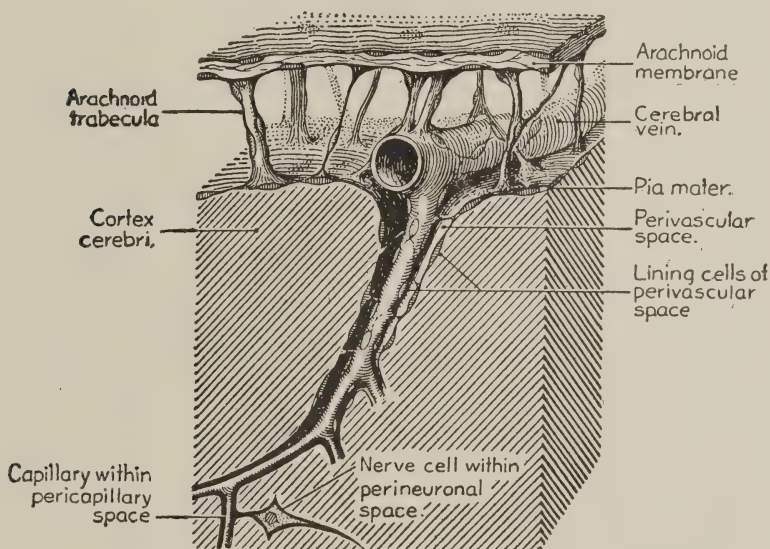


Fig. 2

25 cords examined found a free canal in only three instances, while Kramer, examining 260 spinal cords, found that only 7.23 per cent of them presented a free central canal.

In regard to the penetration of the fluid through the substance of the cord Woolsey claims that a dye introduced into the subarachnoid spaces does not penetrate farther than .5 millimeter into the spinal parenchyma and Stepleanu-Horbatschki also found the dye only in the external layers of the spinal tissue. Marinesco and Draganesco, however, have been able, after injection into the spinal subarachnoid spaces, to find the dye penetrating along the meningeal spinal septa as far as the borders of the central gray matter. In the

thoracic and in the sacral region, where the spinal cord is narrowed, the dye was seen in the gray matter and occasionally even in the dendrites of the nerve cells. Lafora and Prados Such have also found that a dye introduced by lumbar puncture was present in the central canal up to the bulbar region. The same results are reported by Dixon and Halliburton, who found the dye even in the cerebral ventricles when introduced under high pressure.

Weed using intravenous injections of hypertonic salt solutions has shown that the fluid introduced in the subarachnoid spaces reached more than half way through the spinal parenchyma.

Besides the central canal the cerebrospinal fluid may flow in an ascending direction by the so-called lymphatic channels which, however, do not constitute a real reticular system. The experiments of d'Abundo and lately of Guillain have proved that foreign bodies introduced into the spinal parenchyma reach higher positions especially in the posterior columns. According to Guillain the lymph circulation in the dorsal columns is independent of that in the antero-lateral portions. The circulation of the lymph does not take place along a lymphatic reticular system but along the perivascular spaces described by His, Robin, Virchow and Obersteiner. Since these perivascular channels communicate freely with the subarachnoid spaces in the brain (Mott, Lewandowsky, Stursberg, Weed) the same might hold for the spinal perivascular spaces and we must presume that the fluid introduced into the subarachnoid spaces will find its way upward in the spinal parenchyma along the perivascular sheaths.

At this point arises an important question. Does a stream exist which normally goes from the subarachnoid spaces into the nervous cerebral parenchyma along these perivascular spaces? In other words, is the current in the perivascular channels directed from the subarachnoid spaces toward the nervous parenchyma?

Quinke believed that the contents of the lymphatic perivascular spaces were emptied into the subarachnoid spaces. Mott also speaks of such a direction of the fluid. But Stursberg, in sustaining the views of Retzius, Sicard, Lewandowski, Biswanger and Berger, states that the fluid from the subarachnoid spaces reaches the nervous parenchyma along the perivascular channels. Later Ahrens confirmed the existence of such a stream from the subarachnoid spaces toward the nervous parenchyma. The dye particles were found by this author in the ventricular epithelium and in the epithelium of the choroid plexuses one hour after their introduction into the spinal

subarachnoid spaces. Other authors sustaining this point of view are Dixon and Halliburton, and Fleischmann.

The opposite view is taken by Bungart and Ziegler and by Weigeldt, who suggest that the higher ventricular pressure of the fluid would prevent the flow of the fluid from the arachnoid spaces toward the ventricles. Weed, among the others, believes that special conditions must operate to permit the penetration of the cerebrospinal fluid from the subarachnoid spaces into the nervous parenchyma. One of these causes might be as we have said the reflux of fluid following the intravenous injection of hypertonic saline solutions. Under such conditions Weed has been able to find along the perivascular, the pericapillary, and the perineuronal spaces particles of dye previously introduced into the subarachnoid spaces.

We must here emphasize the utility from the practical point of view of the intravenous injection of hypertonic solutions of sodium chloride (Weed) or oral administration of magnesium sulphate (T. Fay) for the establishment of osmotic changes drawing fluid from the cerebral and spinal subarachnoidal spaces into the nervous parenchyma.

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Another important point to consider is the path of absorption of the cerebrospinal fluid. This point is of great interest as the medication introduced into the subarachnoid spaces besides acting locally on the nervous parenchyma may act indirectly by way of the general circulation.

It was Magendie who first proved that the cerebrospinal fluid was absorbed into the veins since he was able to find dye particles in the jugular veins and later in the urine. Reiner and Schnitzler, and Hill confirmed these results while Key and Retzius demonstrated the absorptive function of the Pacchionian bodies. Besides the venous pathway, Remak and Flatau have followed dye particles introduced into the cerebrospinal fluid along the perineural lymphatic sheaths especially along the olfactory nerve and the lymphatic reticular system of the nasal mucosa and the lymphatic glands of the neck. Lately Sicard obtained the same results and Cathelin, who studied the pathway of absorption of the cerebrospinal fluid, has established this following course: Choroid plexus ventricular system, foramina of Luschka and Magendie subarachnoid spaces, perivascular lymphatic spaces, lymphatic channels, paravertebral lymph nodes and thoracic duct. But it must be remembered that the existence of real lymphatic vessels in the brain is very doubtful and that the lymphatic vessels of the dura mater which were first described by Mascagni in 1775 and

later confirmed by Meckel (1778) and recently by Jacobi, are supposed to be only apparent and due to distension by the fluid injected (Weed).

Frazier and Peet also have been able to follow the stained material introduced into the subarachnoid spaces, along the perineural lymphatic spaces of the optic nerve and twelve hours later have found it in the cervical lymph nodes. In contrast to this slow absorption by the lymphatic pathway the absorption by the venous route was very

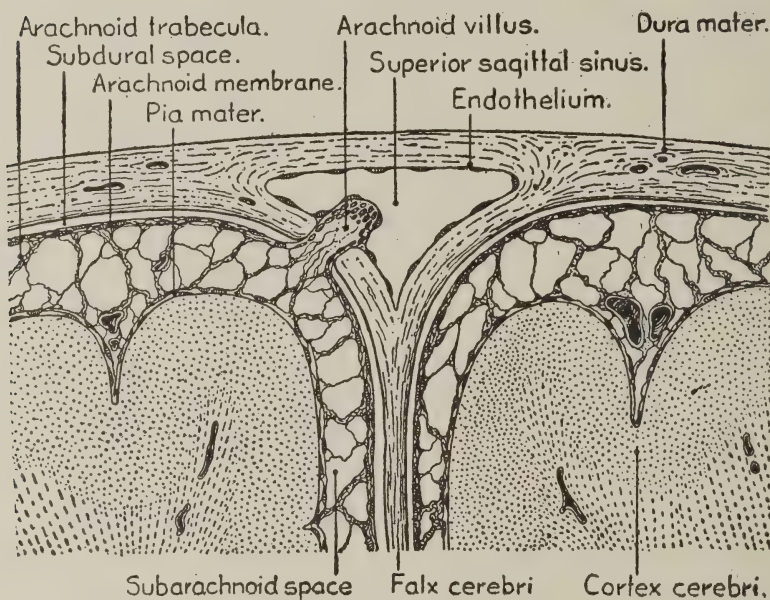


Fig 3

Figs. 2 and 3 are diagrams by L. H. Weed, *The American Journal of Anatomy*, Vol. 31, 1923.

rapid, and only six to ten minutes after the introduction of the dye in the subarachnoid spaces traces of it were found in the bladder. If the dye were introduced directly into the cerebral ventricle venous absorption followed immediately. The time for the passage of the dye into the lymphatic system has been found by Dandy and Blackfan (only one hour and forty minutes) while in the blood its presence was detected in sixty-three seconds and in the bladder in six minutes. Considering the fact that the same rate of absorption was noticed when the dye was introduced into the spinal subarachnoid spaces,

where no Pacchionian bodies were supposed to be present, these two authors claim that the absorption of the cerebrospinal fluid takes place directly by way of capillary bed and they minimize the importance generally accorded the Pacchionian bodies.

The widespread belief that the Pacchionian bodies are the path of absorption of the cerebrospinal fluid was reluctantly accepted at the beginning. Among the important objections was the absence of such granulations in the lower animals and their presence in man only in the adult life.

In his important contributions to the anatomy of the subarachnoid spaces Weed has proved that the Pacchionian granulations are not visible in early life but that the arachnoid villi which are always present, later become the Pacchionian bodies. The villi are covered by an epithelium which acts as a filtering membrane allowing the passage of the fluid into the venous sinuses, and according to this author the cerebrospinal fluid is filtered through this mesodermic membrane from the subarachnoid spaces into the venous sinuses (Fig. 3). Whether this takes place by osmosis or diffusion cannot yet be stated without further investigations. Although the venous pathway is the more important Weed himself believes that at least a small amount of the absorption takes place by the way of perineural lymphatic spaces of the cranial and spinal nerves.

Recently Elman has demonstrated the existence of peculiar granulations in the arachnoid membrane of the spinal cord which resemble the arachnoid villi of the brain. At the level of the emergence of the spinal nerves the arachnoid cells according to Elman form small nodules the histology of which is similar to the cerebral arachnoid granulations. The pathway of absorption in the spinal cord is not then by way of the perineural lymphatic spaces which according to this author are post mortem artefacts, but by way of these villi through which the spinal fluid filters into the venous stream or perhaps into the lymphatic channels of the region (see Fig 1). Dixon, Halliburton and Lochelongue also share the opinion that the cerebrospinal fluid is absorbed by the way of the venous system.

On the other hand, Stepleanu Horbatschki, and Fontecilla and Sepulveda believe that the main path of absorption is the lymphatic system and that the venous stream only represents a secondary way of discharge.

We must add here that some authors such as L. Bard deny the existence of a real circulation of the cerebrospinal fluid stating that the displacement of the fluid is due to the systolic expansions of the blood vessels but has no physiologic importance. Dercum believes

also that the cerebrospinal fluid has no nutritive action and that it acts merely as a hydraulic suspension for the central nervous system. The fluid according to him has no direct connection with the perivascular pericapillary and perineuronal spaces.

Conclusions

From this review of the literature concerning the circulation of the cerebrospinal fluid we may summarize from the experimental side the following general statements which confirm the possibility that a drug introduced into the ventricular cavities or subarachnoid spaces may reach the central nervous parenchyma.

(1) The existence of a descending current from the ventricular cavities toward the subarachnoid spaces seems to be established by the experiments of Quincke, Lafora, Ahrens, Prados Such, Stern, Gautier and others. The fluid introduced into the ventricular cavities passes into the subarachnoid spaces by the way of the foramina of Luschka and Magendie or by the way of the functioning membrane described by L. Weed.

Besides this pathway, according to the studies of Monakow, a drug introduced into the cerebral cavities may pass through the cerebral parenchyma directly reaching the nervous elements by the way of the perivascular and perineuronal spaces. The ventricular fluid reaches the central spinal canal when free of obstructions by direct communication.

(2) A drug if introduced into the spinal subarachnoid spaces may reach the cerebral parenchyma. In these cases the displacement of the fluid is due to the ascending current mentioned in the experiments of Quincke, Ahrens, Dandy and Blackfan, Solomon, Thompson and Pfeiffer, Marinesco, and Draganesco.

(3) A drug introduced into the subarachnoid spaces may reach the central nervous parenchyma passing from the exterior toward the interior as shown by Marinesco, Draganesco, Lafora, Prados Such, Dixon and Halliburton, Stursberg, Fleischmann and Weed. Such a penetration is greater if the medicament is introduced under a high pressure or after the use of intravenous injections of hyper-tonic salt solutions.

Furthermore Kramer claims the existence of an ascending current in the central spinal canal, so that the fluid reaching this canal from the subarachnoid spaces may transport upward any drug present in the fluid.

(4) The fluid may reach the arterial circulation indirectly by way

of the perineural lymphatic pathways or by the way of the venous absorption as emphasized by Weed.

5. We might state in conclusion that from the theoretical point of view the intraventricular and intraspinal therapy is justified by the experiments of many authors who have established the possibilities of a dye reaching the nervous parenchyma. From a practical point of view intraspinal therapy allows a medicament to reach the nervous tissue directly and immediately besides the secondary indirect action of the same drug by the way of the general circulation.

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ARISTOTLE*—THE MAN AND HIS MIND†

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It is not entirely due to the stories circulating among philosophers in the thousand years immediately following the death of Plato that the modern view prevails which makes Aristotle a rebel to the instruction and the philosophy he received from Plato and that the philosophy of the one is often regarded as the antithesis of that of the other. It is not due to this ancient gossip so much as to the recent status of science over against philosophy and psychology. It has been asked how is it possible that Aristotle, the protagonist of biological science, could be aught but the antagonist of the mysticism of the *Phaedo* and the wild conjectures of Plato's *Timaeus*? It needs the long and careful study of the *de Anima* and the *Metaphysics* in the text and their comparison with the *Timaeus* and many of the earlier dialogues of Plato to perceive how out of these teachings of his youth Aristotle drew the inspiration and not a little of the nutriment for the work of his maturer years. I think Jaeger and Ross make this sufficiently clear in the two volumes which have recently appeared, the one from Berlin and the other from Oxford. This represents, it seems to me, fairly well the common view of modern scholars familiar with the best texts. The best texts, for English readers at least, Ross has given us for the *Metaphysics* from Oxford and Hicks has given us that of the *de Anima* with a translation from Cambridge. The first is a two volume work and the latter makes up a large thick volume from the short text of the Greek, much more than the half of each volume of the three being taken up with the notes and comments of the editors of the text. There is no lack then of recent work to establish the relationship of the philosophy of Aristotle to that of Plato and still further work has been done and is in progress at Oxford on the other works of the former.

That the development of the aristotelian philosophy had the doctrines of Plato for a start and a support no one, sufficiently instructed,

* Aristotle, by W. D. Ross, M.A., Fellow and Tutor of Oriel College; Deputy Professor of Moral Philosophy in the University of Oxford.

† Aristoteles, *Grundlegung einer Geschichte seiner Entwicklung* von Werner Jaeger, Berlin, Weidemannsche Buchhandlung, 1923.

can ever much have doubted. So far then as the modern prepossession of Aristotle being at swords point with his master's doctrine is concerned, except on some points of detail and his total rejection of the form at least that Plato gave to his "Ideas," it is surely entirely erroneous. How far the pupil followed the master and whence he took his start is the theme of these two volumes on Aristotle, the man. One easily imagines on what might have been founded the ancient gossip of an open breach between them. Personal argument between men of such commanding genius, even when one carries with him the dignity of age and a name of great distinction and the magnetic manner of great personal charm in contrast to the youth and inexperience of the younger man, was apt no doubt to be vivacious to say the least. It seems very probable that Aristotle had doctrinal differences with the other followers of the dead master and very possibly personal ones also, but Jaeger's book especially and that of Ross scarcely less exonerates him from any lack of reverence toward the master himself. Yet it has been not infrequently intimated by modern critics, such as J. D. Mabbott in the *Classical Quarterly* (April, 1926), that Aristotle is not only superficial but unsympathetic in his treatment of Plato. To the casual reader this may occasionally seem a justified criticism, but even this critic implies that Aristotle did not realize that his own philosophy was in line with the last views of Plato. He either did not know it or had forgotten it. Now of course if one goes so far as to think that Aristotle had little originality and if one has an exaggerated view of his dependence on Plato one might well think Aristotle acknowledged it too infrequently.

This way of thinking, and I do not mean to say it is entirely the view of Mabbott, Ross especially is at pains to contravert in his edition of the *Metaphysics* and he cites many specific passages where Aristotle acknowledges he is a platonist. The inference even without such frank avowal would at least be that he must have known the later doctrines of Plato very well indeed, since he had listened to him and conversed with him for twenty years before Plato's death and neither Plato nor his doctrines were liable to be forgotten by the marvelous mind of the young Macedonian from Stagira. As a matter of fact he was fascinated by the magic of the great Athenian. Not to have acknowledged it would have been something worse than a "lack of sympathy"—nothing less than ingratitude and disingenuousness. Ross and Jaeger join in disabusing our minds of such an inference and however much one may indulge in putting between the lines what is not to be found in them there is hardly one of them—

not a page in his philosophic works, Ross insists, where one may not find the influence of Plato.

Upon the death of the latter, when Aristotle was nearly forty and had been twenty years (367–347 B.C.) at the Academy, the tie was broken with it owing to the dissensions arising thereupon in it perhaps, but more probably quite as much to the dominance of the influence of Demosthenes, the enemy at Athens of Macedonian Philip. Aristotle retired to the Asiatic shores of the Mediterranean at Assos. There were branch schools of the Academy in several places where Greeks were colonized around the Mediterranean whence Plato had drawn many of his pupils and these returning home formed circles or clubs where the platonic philosophy was discussed. Such an one there was at Assos, near which at Atarneus the eunuch Hermias was ruler of a nominal Persian dependency. He was a man of talent and liberal learning, a friend and secret ally of Philip, a rebel to Persian rule. His niece and ward Pythias Aristotle married and loved as long as she lived. He cherished her memory as long as *he* lived. By her he had a daughter he named after her mother. It was through her and her husbands that the line of descent bound the family of Aristotle to the school of Alexandria, for her third husband was Metrodorus, the pupil of Chrysippus and the tutor of Erasistratus. Aristotle gave her first in marriage to his adopted son Nicanor. In his will he provides for her and there is a touching clause asking that the bones of Pythias, her mother, shall be brought to lie in the grave with his own. For the concubine who succeeded to her bed and for the son Nichomachus, born of this latter union, after whom the *Nichomachean Ethics* is named and for many others and many other things he provides and asks that the statue of his mother shall be put in the temple of Demeter. His hymn to Hermias, the Lord of Atarneus, must have been written shortly after he had returned to Athens with Pythias and founded the Lyceum. The Persians suspecting the complicity of Hermias in the plots of Philip had captured him, put him to the question with torture and, on his refusal to divulge anything, crucified him. Aristotle honored and esteemed him and in the hymn he recounts his virtues and laments his heroic death and publishes it to the world when the shadow of Persian power still hovered over the mainland of Greece and dwelt in its Asiatic cities. In Jaeger's account he becomes a man of flesh and blood, loving and lovable. Upon the altar he is supposed to have raised to Plato in the plains of Attica he spoke of his master as one whom bad men had not the brazen effrontery to praise.

The centuries of the history of thought have stood a little abashed and estranged in the presence of the philosopher and it is helpful to have lying before us the living record of a man who warms our hearts while he taxes our brains. In tracing the evolution of the mind of Aristotle Jaeger does not allow us to forget the man. Both he and Ross, but Jaeger especially, in numerous quotations from the fragments of the lost dialogues of Aristotle allow us to see the link which connects the later dialogues of Plato with the later works of Aristotle. It is his golden talk in his dialogues which Cicero (*Acad.* II, 38, 119) admired, but it did not save them from neglect and preserve them for us, while of his systemic works, much of them probably delivered as lectures, at any rate in an entirely different form, we have a very considerable part. Aristotle, born 384 B.C. in the peninsula of Chalcidice at Stagira, not far across the land from the modern Salonika, with which the World War has made us familiar, had been sent to Athens by his guardian at the age of seventeen, for Plato's great name and fame were widespread. As has been intimated the tyranny of Philip had created in Athens an atmosphere at the time of the death of Plato (347 B.C.) which drove him away and perhaps other causes contributed to it. He returned when Alexander's power was making the world safe for him who had been his schoolmaster at Pella. This time (335-4) his coming to Athens was followed by the founding of the Lyceum. He enjoyed the protecting influence of Antipater, ruling for Alexander in Macedonia, but when that waned and the latter died at Babylon in 323 B.C., Aristotle returned to his native land, but his home having been destroyed he died at Chalcis in 322.

He was never a citizen of Athens and had to rent the buildings for his school. He lived there in his second stay under the Macedonian hegemony, but in his early life he lived under the protection of Plato, who was closely allied in relationship with the noble and influential families whose influence was paramount when Aristotle was a student. He is not liable to have quarreled with Plato. Plato gave him more than protection. He gave him the basis on which to build his own superstructure. Ross says he gave him especially his notions of substance, of quality, quantity, relation, activity and passivity. This is a pretty comprehensive statement. These things include most that lies at the basis of all philosophies and of all physics. It is rather comprehensive, but it comes from Ross, whose familiarity with aristotelian doctrine can not be gainsaid, the editor of an extensive edition of the text and critical comments on the *Metaphysics* and of this other volume on the life of Aristotle him-

self. As we turn to other works, the *Posterior Analytics* (1–31) for instance, we note that Aristotle insists it is impossible to have what he calls scientific knowledge through sensation, for he has in mind its definition as the knowledge of universals and abstractions. Surely this was platonic doctrine. From the senses we get our opinions, from our minds we get our knowledge. The modern reader must take note of this variation from his own conception. Knowledge of facts is knowledge for him, but for Plato and Aristotle it was the relationship between them, which constitutes knowledge. The shade of doubt Heraclitus and Protagoras cast over the senses, the transcendental Ideas of Plato, despite the rejection of some of these doctrines by Aristotle or rather of the deductions from them, we see influencing his philosophy and occasionally impairing his objectivity.

In contradiction with modern science then ancient science was a knowledge of universals and in this the modern scientist at least can readily see what merges the science of Plato and Aristotle into mysticism, but it forms an indissoluble bond between them. We see, too, prejudiced though we may be, that facts though they are the cause of knowledge are not knowledge themselves, however coextensive with it they may be. Ross seems to think Aristotle did not unreservedly accept this view of causality. Science can not be content with a plurality of causes—the true aim of science and its goal is the First Cause. This modern science, chiefly for prudential reasons of many kinds, formally repudiates, but it is a part of the teleological cast of aristotelian thought. As a matter of fact modern science has pushed along until it finds itself face to face with monism. If science is prepared to say there is nothing beyond we are at the goal. There is a disposition, as I judge from some recent remarks by Sir Joseph Thomson, to conceive of dust on the electrons, but barring this we are within hailing distance of Aristotle's Unmoved Mover and it behooves us to be cautious about reproaching him or Plato either with mixing theology with cosmic mechanics. We skirt physics thus and we are no less involved in the mystical when we turn to ancient physiology and psychology. Food from without sets up movements in our bodies, but no less it is at the back of causation of the movements of generation, of sensation, of desire in our souls. Yet back of the food, back of the material lie the dynamics with which matter is merged, some One Thing which we call a mysticism in the ancients, but as matter and energy pulse back and forth into one another in the conception of the modern physicist we don't know what to call it.

Although it is for the geometer and the physicist to know of this it is no less a call for the doctor to realize it also. He must know both the nature of health and that of the gall and the phlegm in which health is circumstanced. If this same science studies both end and means there seems no excuse for the doctor not to be aware of something which is knowledge as distinguished from opinion by Plato. It is not always clear whether or not Aristotle's Capacity and Actuality is not in some degree a parallel at least for this knowledge and opinion. As Ross suggests, we perhaps have to go beyond the natural meaning of causation in the English language to perceive the very perceivable logical sequence here.

Aristotle was as much disinclined to consider space and time realities as was Plato or as are modern philosophers. To the unphilosophical on the other hand it seems at first blush that it is not necessary for Aristotle, even if he rejects space as nonexistent, to reject number as an actuality too, but number or our conception of it he tells us is dependent upon our separating one object from others.¹ As it takes space to do that we may follow the thought. It is a little astonishing, however, to find him (I know not how genuine the passage is), declaring that sound exists even if there are no ears to hear it with. It may be somewhere in rebellion against Protagorean doctrine, as there seems no reason why we should doubt the actual existence of the bitter and the sweet in that case. We are not abandoning the solid ground of modern science willingly in thus recalling the ancient problems. We have come around to them in science again. Carr has recently said: "The progress of discovery and the results of scientific experiment, abundantly confirmed, have necessitated a complete revision of the whole metaphysical basis and a reform of the whole setting and framework of science."

This is far more apparent to the philosopher and metaphysician, and of older date, than to the physicist. He does not yet seem fully aware he has passed the boundary of physics and is well within that of the ancient metaphysics at least. The evolution of fact and theory has been so gradual he has passed the line unnoticing. He brings nothing new into the heart of the metaphysics of Aristotle. All he brings of matter merging into energy was worked out in essentials in the old philosophy. The Germans have been more alive to this transcendental trend of science than the English but both of them far more than we. Arthur Libbert in the *Monist* reports of his metaphysical countrymen in Germany that the tendency has been to the "rejection of the mechanistic standpoint and mode of interpretation. None of them attempt to define the structure and meaning of reality

in the terms or in the concepts of the natural sciences," but they are approaching the definition of it in the study of the history of scientific and philosophic thought and associated with this tendency, which for two generations has been alive in Germany, are now the recognized tendencies to develop the philosophy of history as well. They aspire to lay "the epistemological foundation of the historical sciences" in such a way as to lead to a more satisfactory interpretation by a rational metaphysical and psychological analysis of the facts which they furnish. We see this refusal in modern philosophy to follow the direction pointed out to it by the materialistic science of the last century and it is easy to find a marked drift in the science itself of to-day, that of the physicist and the biologist alike, to metaphysics and mysticism. Something of this faltering to follow the science of the nature philosophers, so marked in Socrates, may be found in Aristotle and this he owes to Plato and is a mark of his platonism.

His tendency is to revolt from Pythagoreanism and the agnosticism of Protagoras, but not in this respect from platonism. There seems to be a wavering, but it may be due to the mixing of spurious works with his own or to interpolations and the awkward "restorers" of his original mutilated works and the scraps of notes of his lectures. There seems no reason why he should doubt the reality of the bitter and the sweet if he insists on the reality of sound. If there is no such thing as number unless man is there to count, this would seem going over to Protagoras in order to refute the pythagorean in Plato. Number, depending on the observation of man that things are separate, postulates the reality of space and the separation of events postulates the existence of time. This suffices for the ordinary man. We know nothing except by the apposition of opposites. To unity there can be no opposite. There may be a monad reality, but we can know nothing of it. Relativism does not admit of time or space and we are face to face with the concept of Unity. As I understand it this is the ancient philosophy and the modern idea of reality too, but the ordinary man is not "in it."

Ross goes on to quote from Aristotle's *Physics* to which I have not had access. Whatever changes is divisible and as change at least is eternal number would seem to exist without the intervention of man to measure and count all things for us. It is only in the Unmoved Mover of Aristotle we would seem to get away from number. To Aristotle as to Plato this seems at times the only Reality, but in abandoning Pythagoras we are plunged into worse mysticism than ever. Motion is change and what changes is divisible.

The Unmoved Mover is unchangeable. The ordinary man has had the bitter and the sweet taken away from him and number, too, in the pursuit of reality and finding that physics thus drifts into metaphysics he is comforted that in the absence of motion and change that physics must disappear also.

I have in a previous number of this journal touched upon a number of these points anent Aristotle's idea of consciousness and I will not go further in reference to the extended analysis Ross makes of this confusing topic. It is confusing because we are obliged to consider the material and the immaterial, the perceivable and the unperceivable—the union of soul and body. We can swim along in the mysticism of Plato who denies there can be an image of an image, but Aristotle throws us into dismay. He is puzzled in the *de Anima* (430-a-2) over the nature of the process by virtue of which we perceive that we perceive. Ross goes into an analysis of this and into Aristotle's ideas as to dreams and these may be of interest to the Freudians. He reminds us that in that part of the *Metaphysics* which is supposed to have been of early origin and therefore permeated with platonic thought, God is regarded as Actuality and Energy at work, which seems again to the ordinary mind as incompatible with Aristotle's Unmoved Mover. That is, as I have insisted, but a replica of Plato's mysterious God behind his demi-urge. He is the primary intelligible and the source of intelligibility in other intelligibles (1072-a-26), but the inference is unmistakable although Aristotle does not name this as the Deity.

By means of parallel columns Jaeger traces not so much the relationship of aristotelian to platonic thought as the continuity of the evolution of the one to the other, not forgetting the diversions in different directions and the contradictions. This and the book of Ross are admirable contributions to our knowledge and they increase the breadth of our conceptions of the aristotelian philosophy and of Aristotle, the man.

SOME FACTORS WHICH DETERMINE A SCHIZOPHRENIC (DEMENTIA PRAECOX) REACTION
IN MALES: A CONTRIBUTION TO THE
STUDY OF HUMAN BEHAVIOR *

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(Continued from page 481)

Case V. H. M. Admitted to M. S. H. August 21, 1922. Age twenty-two. Born in U. S. Single. Attended high school for two years. A pencil engraver. H. M. was always sociable with the boys, in fact was considered popular with them. Athletics was his hobby. He never had heterosexual intercourse and had practically no interest in the opposite sex. He was greatly attached to his mother. *About three months before admission to M. S. H., he began to act queerly after he had been struck on the head with a baseball bat.* He complained of headaches and was noisy and restless at night, kept his brother, who slept in the same room, awake. Two months prior to admission he stopped work, said the machinery in the factory bothered him (symbolically means that his sexual apparatus was bothering him). He imagined that people called him: "snake charmer," "c. s.," "fairy," "woman." After bathing he would show the water to his mother and say that he was filthy (symbolic for filthy thoughts and a wish that his mind were cleansed by the water); said it showed that the devil was in him (symbolic for his sinful incestuous and homosexual thoughts). He spoke a great deal about sexual problems; thought that sexual relations with a woman would cure him. On one occasion said that suicide would be the best thing for him. The day before his commitment he asked his mother to allow him to have sexual relations with her. On the ward he showed the usual seclusive, taciturn behavior of the schizophrenic. One day, after brooding for a long time, he suddenly said to the ward physician: "What do they mean when they ask me for a match?" What do you think they mean? Patient replied: "I think they mean the membrum" (the penis); this is a good example of the archaic form of thought processes so characteristic in schizophrenia. He then sank into an abstracted state, saying: "I guess I'm no good." Emotionally he was somewhat depressed. There were numerous ideas of a persecutory nature present; he said: "The boys call me names . . . snake (old phallic symbol) charmer . . . mosquito, fly, c.s., fairy." Are you a mosquito? Patient replied:

* Read before the New York Psychoanalytic Society, Feb. 23, 1926.

"I guess I am . . . when I swim in the river a scum forms on the water, that shows I'm evil . . . the odor of my breath and the heat of my body harms people (ideas of magic which are compatible with the narcissistic stage of libidinal investment) . . . I watch them in the cars and they then turn white when I come near them . . . I have phlegm burning in my throat (symbolically expressing that he had semen in his throat, a burning passion) . . . I spit up stuff that looks like seeds, two or three little white things, I think it is my manhood backing up in my blood since I stopped masturbating (probably associated with incestuous phantasies) . . . I smell awful . . . I smell myself all the time . . . smells like feces . . . I think I'm hollow inside . . . I feel that I cannot control myself . . . I do things and think things that I do not want to . . . I think the devil is controlling me" (reminds one of the saints who thought they were possessed by the devil and their tremendous religious fervor aimed at overcoming impulses attributed to the evil spirit). One cannot help but have a feeling of sympathy for this boy, so strongly fighting against his perverse impulses. Subsequently the patient continued to express about the same ideas, had the same auditory hallucinations. At times he displayed suicidal tendencies. He began to improve after eleven months of hospitalization. It is interesting to note that this improvement dated quite distinctly from the time when he impulsively performed fellatio on a man in his ward; he confessed this act to me; the voices ceased about the same time. The charge attendant of H. M.'s ward informed me that on several occasions he observed H. M. asking other patients to allow him to perform fellatio on them. At such times he did not seem to be his usual self and appeared more or less confused. The patient confessed to me, after the active symptoms of his psychosis had subsided, that he had homosexual feelings which he suppresses and tries to control; in his normal state he has marked antipathy to this form of sexual gratification.

Now we will come to an explanation of why the psychosis was precipitated by merely a slight blow on the head with a baseball bat. One of the ceremonies of the athletic club to which he belonged was to pass a baseball bat from member to member (symbolically interpreted this ceremony would mean a mutual handling of each other's genitals). He attended one of the meetings some time before the psychosis broke out, and when it came his turn to receive the baseball bat, he became upset, distracted, and momentarily confused. When I asked him to give his free associations to baseball bat, shortly before he went on parole, he produced the following: "golf sticks, canes, pencils" (all three associations are symbols for the penis) . . . (after much hesitation and blushing) "the erect penis." To his unconscious, baseball bat stood for the penis. Being struck on the head symbolized a homosexual assault (fellatio). The more or less

stunned condition of his brain following the blow, momentarily paralyzed the repressive mechanism, a late acquired function, and allowed the repressed sexual impulses to enter consciousness in the form of mental symptoms. The patient was paroled from the hospital after a year's residence; at this time he was free from all psychotic manifestations, and has since been discharged. The diagnosis in the case of H. M. is schizophrenia paranoides.

Case VI. F. N. Admitted to M. S. H. Sept. 13, 1923. Age twenty-four. Born in U. S. Single. Common school education. Porter. According to his relatives he manifested no nervous or mental symptoms during his childhood. At school he made rather poor progress and was inclined to be mischievous. After leaving school at the age of 16, he went to work but changed positions rather frequently. His parents said that he was sociable, friendly, and always fond of sports, inclined to be religious. With strangers he was irritable, reserved, shy, and bashful. The patient said that he preferred to be alone and that he was indifferent to women. There was a tendency to be stubborn and quick tempered; he would not confide in others. On Sept. 5, 1923, the patient came home and told his mother that two days previously he had been badly intoxicated; his conduct, however, appeared quite normal. A few days later he came home and asked whether his employer had been there; then quite unexpectedly said that his fellow employees were watching and laughing at him; that they were making fun of him all the time. He refused to give any explanation. His parents advised him to give up work, which he did. Soon he became more and more restless, paced up and down the floor, and occasionally took a short walk. He began to say that his former boss and other employees were after him, but would not explain himself. He was then committed and sent to M. S. H. On the wards he was described as well behaved, seclusive, and suspicious. Most of his time was spent in sitting on the ward benches reading the daily newspapers. He took no interest in his surroundings. His conversation was relevant and coherent; he only spoke when addressed. His emotions were quite stiff and rigid; his facial appearance, dull and indifferent. He denied being depressed stating that he felt fine and happy. He spontaneously admitted that for the past year people had been looking at his face in a peculiar way as if trying to find out whether he was a "c. s."; that he was watched and followed by these people. Why did you think they looked at your face in that way? He replied: "To tell you the truth I think that they thought I was a "c. s." He admitted auditory hallucinations; he believed that people called him: "c. s.," "fairy," "woman." Before he came to the hospital he imagined that men were pursuing him in order to perform sexual acts upon him. According to the patient, *the psychosis began about two years prior to his commitment when he was approached by a man on the street who wanted to*

sell him some rings. The patient having no money, the stranger said: "You can give me what you want for them, or I will take it out in trade." The patient suspected that this man was making an invitation for homosexual intercourse (and perhaps he was, unconsciously. Paranoiacs often have a fine appreciation of such veiled invitations). From that time on he suspected that people thought he was a fellationist, and that men wanted to have homosexual relations with him. About a year ago, he first noticed that men smiled at him while he was in a public toilet. He believed that this was also an invitation. F. N. gave the following homosexual dreams:

1. "Some man tried to choke me. He had his knee on my chest, and his hands on my throat." (A fellatio dream.)

2. "I frequently dream of fighting or wrestling with men."

Both dreams are accompanied by great fear. The patient's mother told me that her husband was never very lovable or affectionate to her. A situation between a husband and wife of this nature or constant friction between them, divorce, death of the father, etc., are often seen in cases of schizophrenia as factors that by nature cause a mother to bestow too much of her ungratified emotions on her young son. Mothers of a certain type, being without a satisfactory partner, are apt to monopolize the emotional life of their favorite son in the most tragic way; frequently succeed, in the most cunning manner, to such an extent that they prevent the adoring son from reaching the biological function which nature intended him for. When a son of this type tries to establish a satisfactory love relationship with some woman, this kind of mother rears up and does everything possible to destroy the relationship, and finds innumerable reason for his ingratitude toward her. And when her son gets married, the young daughter-in-law in many instances falls heir to much abuse from her mother-in-law; in our cases the son, as a rule, tacitly sides with his mother. At all events, F. N. was paroled from the hospital on February 5, 1924. He stated that, although formerly his hallucinations seemed real to him, there was no doubt now that they were only imaginary. He did not have the faintest insight into the homosexual nature of his trends. Diagnosis: schizophrenia paranoides.

Case VII. W. P. Admitted May 8, 1924. Age thirty-one years. Born in United States. Single. Common school education. Soldier. One sister epileptic and intemperate. As a child the patient never displayed any nervous or mental symptoms. His make-up was described as: sociable, friendly, generous, kind hearted. On admission the patient said: "In April, 1924, I went to a hospital and, while there, received a round white pill (symbolized semen to the patient's unconscious). The

following day my lips swelled up and I was nauseated." (A psychic nausea. Nausea is occasionally seen in our schizophrenias in reaction to dreams or uncontrollable phantasies of fellatio.) "Since that time I have been poisoned; the poison is in my body. . . . I believe I have syphilis." (He did not have syphilis. Here the word syphilis symbolizes homosexual impulses, *i.e.*, a loathsome affliction.) "Doctor, I'm a goner . . . I'm going to hell . . . I have poison in my system . . . a man named P. (he probably was greatly attached or attracted to P.) put poison in my throat . . . no, doctor, you cannot cure me," (how different is the mental attitude in a real organic disease) "it is too late . . . they said I wanted them to poison me . . . it ain't true . . . I wanted to live . . . I have syphilis of the brain and spine." (This is untrue. He had no physical symptoms: Wassermann negative.) W. P. told me that shortly after receiving the round white pill, he began to hear voices calling him "c. s." and other derogatory names.

In the case of W. P. a given act, which symbolized an unconscious wish and its gratification, precipitated the psychosis. The arm and hand of the man who gave the patient the white pill symbolized the penis; the pill, semen. One of my other schizophrenics, H. M., after a drinking party with his friend, M., who slept in an adjoining room, had a hallucination of M. walking up to the side of his bed and putting some cocaine into his (H. M.'s) nose; this was accompanied by a seminal emission. (The dream is a wishfulfillment of H. M.'s unconscious desire to perform fellatio on his chum, M.); the same patient said: "People threw pills into my window at night; I always imagine they give me poison . . . I came pretty near taking poison . . . these fellows were in the club with a square box with a needle and syringe (symbol for the penis) . . . I think it was coke . . . they got it into me some way . . . I think maybe they threw a powder up and they 'coked' me up." Another schizophrenic complained of men throwing cocaine (symbol for the pleasure giving semen) on his bed causing him to have seminal emissions. The diagnosis in the case of W. P. is schizophrenic paranoides.

Case VIII. P. T. Admitted to M. S. H., January 5, 1924. Born in Norway. Age twenty-eight. Draftsman. Single. Roman Catholic. Collegiate education. Nothing is known about the patient's early childhood. His mother died when he was nine years old, and he was brought up by his mother's sister who always babied him. Whenever he embraced or kissed this aunt (mother imago), he felt nauseated (because of unconscious incestuous impulses); said he could not understand this because he was always very fond of her. And when he reached his sixteenth or seventeenth year, he often was conscious of a

strong desire to experience sexual intercourse with her; such a desire seemed silly to him, because she was so much older than he. She was forty years old at the time. P. T. said he has always felt attracted to women of forty since that time. He also admits having had incestuous feeling for his sister at times. His father never understood him. The patient indulged rather frequently in heterosexual relations, but always suffered from ejaculatio precox, and at times was impotent. About two years ago he noticed that his attraction to women was gradually diminishing. He denies ever indulging in homosexual relations. The patient's mental symptoms, in the form of ideas of reference and delusions of persecution, manifested themselves quite definitely about eight months before his admission to M. S. H., i.e., May, 1923. *The occasion which precipitated the psychosis was a visit to his apartment by a fellow employee whom the patient was very fond of.* The patient had invited Mr. D. to his apartment for the purpose of showing him some pieces of sculpture which he had just finished. The patient informed D. that it was quite expensive to indulge in such a hobby, whereupon, according to the patient while still in a psychotic state, D. replied: "Why don't you take up 'cock-sucking' and get \$10 a shot." With this information, I had Mr. D. visit me at the hospital to find out what he had said to the patient and obtained the following: "*I told the patient about a young male friend of mine out of work who secured a position as elevator boy in Atlantic City and how this lad used to get \$10 for accommodating fellationists.*" From this one can see how the unconscious fellatio cravings of the patient inverted D.'s statement so that it referred to him; and from what follows one can recognize an unconscious wish on the part of the patient to indulge in homosexual acts with D. The patient, after hearing D.'s remark, imagined that D. was a fellationist; that he wanted P. T. to perform such an act on him (and perhaps unconsciously D. did wish for it); he felt depressed and had pains in the head. Later on, while in a subway train with D. he noticed a man sitting opposite them pushing his tongue against his cheek at the same time looking at D.; this convinced P. T. that D. wanted someone to perform fellatio on him. The patient got so that he was afraid to go on parties with D. fearing that they might develop into homosexual affairs. In the office D. would often lean on the patient's shoulder (admitted by D.) and the patient said that once he had a feeling that D.'s penis was erect. The patient states that he threatened to beat up D. if he did not stop this habit (denied by D.). D., however, admitted that he did put his arms around P. T. at times, and that the patient always seemed to object to it. D. also said that the patient once told him: "Somehow I don't fit in with the other fellows." But they never felt that way about him. Mr. B., another fellow employee of the patient, added that he had long observed that P. T. liked D. more than any other man in the office. Shortly after the episode when D. made certain statements in the patient's apartment,

he experienced a feeling of soreness in his throat, then his mouth felt as though it were getting bigger and hollower. Finally, about two months before he came to M. S. H., he began to be aware of an almost uncontrollable impulse to perform fellatio; this feeling seemed as foreign to him as a tumor would that had suddenly begun to appear on some part of his body; he could not understand how such a craving ever came into his mind. There were times when he felt as though he had a penis in his mouth and said: "I feel that I must clench my teeth to keep it out (this is probably the cause of a peculiar hissing quality in the speech of some homosexuals), and I have to spit." He would hallucinate the odor of semen or feces. He imagined that there was something in his food which looked like semen (a very common delusion in schizophrenia which can be elicited on asking the patient if he has noticed semen in his food. One of my patients believed that the attendants collected semen from the clothes of all the other patients and put it in his food). P. T. gave an account of visual hallucinations in which naked male figures were having a sexual orgy, also auditory hallucinations of his mother's sister (mother imago) calling him back to his mother's birthplace. With a feeling of surprise said: "I have emissions at night without dreams (the dream content was undoubtedly incestuous and therefore repressed). After several months' residence in the hospital he improved markedly. The delusions and hallucinations disappeared entirely. There remained, however, a tendency to mild outbursts of laughter; it was uncontrollable and the patient could not explain it. He said the laughing (which lasted a few seconds) came on spontaneously without accompanying ideas, and I believe it acted as an automatic, tension relieving mechanism, an outlet for grossly pent up sexual energies. He had good insight into the homosexual nature of his psychosis, and after I went over the whole case with him, he spontaneously said that he could see no other cause for his psychosis. Even admitted that at times he felt attracted to D. In spite of the unusually good insight, I feel that he has not fully adjusted to his homosexual impulses, and that if they ever again broke through the barrier of repression he would fall back into his old defensive attitudes and flee into the psychosis. In fact, he assured me that he could never gratify such impulses; they are absolutely against his ideals.

To sum up, then, we have a case who in early childhood developed an incestuous attachment for his mother; this was later transferred in an attenuated form to his sister and mother's sister. Against these incestuous impulses he reacted by developing an intrapsychic barrier aimed at curbing them. In doing that he produced an inhibition against satisfactory heterosexual transference, which accounts for his impotence. The sexual impulse, being prevented from attain-

ing adequate outlet heterosexually, dammed back, as it were, and inflated the homosexual component of the bisexual anlage. If he had a large amount of the female in his anlage (like many homosexuals) and a different philosophy of life, he might have developed into a common, ordinary homosexual and never into a schizophrenic. As it was, however, P. T. was the picture of masculinity, both physically and mentally; the thought of homosexual gratification disgusted him. Because of his strongly repressed homosexual tendencies, he felt that he "did not fit in with the other fellows"; that was also why he objected to the harmless display of affection bestowed on him by D. The repression of the homosexual impulse in these cases is not a complete, static affair, but subject to a variation in degree of impulse and contraimpulse, a change of equilibratory balance. So that in spite of the repression he perceived a certain degree of attraction to D. which apparently never was consciously sexual. D. made a remark which, as far as P. T. was concerned, certainly could be taken as an invitation to indulge in homosexual relations (unconsciously P. T. wished it), it acted as a stimulus to the repressed impulse causing it to momentarily flare up, as it were, and this called for the establishment of an equilibrium between impulse and contraimpulse on a new plane, an increased voluntary reinforcement of the "introversion reflex," manifested by an increase of stiff affect, to a degree that complete introversion took place which automatically produces the schizophrenic symptomatology. In the psychosis, the homosexual impulse was gradually dissipated by wishfulfilling dreams and hallucinations accompanied by seminal emissions just like similar dreams in heterosexuals. And as that impulse became diminished in its strength the libidinal support of the reinforced "introversion reflex" became less, the introversion less, and the affect less rigid, *i.e.*, the whole emotional defense reaction became established upon a new plane approximating that which existed before the psychosis occurred. One cannot help but marvel at P. T.'s volitional activity which fought to the last ditch to uphold his ideals; but nevertheless the impulse would have its expression. The diagnosis in the case of P. T. is schizophrenia paranoides.

Case IX. B. W. Admitted January 2, 1924. Born in the United States. Age forty-one. Laborer. Lutheran. Common school education. Mother insane. The patient was always very much attached to his family, and indifferent toward the opposite sex. He admits not caring for women. He was always seclusive, *i.e.*, a transference to both sexes, with the exception of his family, was greatly inhibited. *B. W.'s psychosis, according to relatives, began a year prior to his admission to M. S. H., after he had seen persons being hypnotized by a professional*

hypnotist on the stage. Prior to this incident his relatives never observed any psychotic symptoms. He began to talk a great deal about hypnotism; thought that he was hypnotized, and that it was done by people with whom he lived. He complained of people talking about him, and that certain men followed him intending to do harm (symbolic for homosexual assault). On admission to M. S. H. he said: "I went to a hospital to get my eyes washed out . . . they felt strained like . . . a voice told me that if I didn't get them washed out, I'd be blinded (fear of castration, see the *Œdipus Saga*) . . . I have heard those voices for about a year . . . I heard the voices say something like: 'I love you.' Do you believe in witches or witchcraft? When you are hypnotized they can make you do things you don't want to . . . I didn't see men following me, but I had a feeling that some men were following me, they wanted to hit me (for interpretation, see Case V), poison (see Case VII) or kill me (the sadistic idea of sexual intercourse present in childhood) . . . something like that."

Hypnotism has a very definite meaning to the unconscious mind of neurotics as may be understood from the following: . . . "patients who demand to be hypnotized are masochists. We now understand the secrets of hypnosis better than we did a decade ago; we have learned that these patients see a sort of sexual gratification in hypnosis, that they secretly expect a sexual assault. In accordance with the principle: "Pleasure without blame," they all wish to be delivered up to outside force, to succumb to it without having to reproach themselves later on. Men who wish to be hypnotized are masked homosexuals, and anxiety concerning hypnosis arises from the same source. Several analysts (Ferenczi, etc.) have called our attention to the view that hypnosis in reality represents a sort of fascination, a lightning-like falling in love. Jung tells us that an elderly lady, after the first hypnotic sitting, thanked him with these words: 'I thank you for having been so proper.' That quite plainly betrays what these persons expect in hypnosis. Hence arise the numerous accusations of hysterical women who have been hypnotized." (11)

Case X. F. B. Admitted to M. S. H., December 18, 1923. A negro. Born in British West Indies. Age twenty. Common school education. Porter. Episcopalian. Nothing is known about the patient's early childhood. He came to the United States in 1920, and married in November, 1922. He got along fairly well with his wife until in September, 1923, when he began to quarrel with her and accuse her of infidelity. After F. B. was admitted to M. S. H. he told me that heterosexual intercourse was never satisfactory to him; that it made him depressed (because of its unconscious associations); and during the

greater part of his marriage he was sexually impotent. In fact he said: "I couldn't get it stiff for a million dollars." His incestuous tendencies are shown by the fact that at seven or eight years of age he tried to have sexual relations with his sister; at nine and ten years he dreamed regularly of having coitus with his sister. F. B. was never a good mixer, and spent most of his time reading and studying. About the middle of September, 1923, the patient left his wife following a quarrel (much of the quarreling between married couples could be explained by the presence of sexual impotence in the male or frigidity in the female partner), and came to his brother's house to live. He had an injured thumb but would not explain how it happened. He accused his wife of consorting with other men; mumbled and talked to himself and went to bed with his shoes on; disappeared and was later found in a stranger's toilet. He gave away money to persons on the street. He imagined that boys on the street called him bad names. Just previous to admission he asked his sister-in-law for a pawn ticket, and when she would not give it to him, he went to the kitchen, got a cup and threatened to kill her. He was then sent to Bellevue Hospital where he said: "Sometimes on the street they talk about me . . . call me bad names . . . point their fingers at me and laugh at me . . . maybe they want to get rid of me . . . I don't know why else they do it." On admission to M. S. H., F. B. was quiet and well behaved, his conversation was coherent and relevant. He appeared to be somewhat depressed although stated that he felt well and happy; not afraid, worried, or depressed. He admitted hearing voices for six months previous to his admission to M. S. H.; people called him: "c. s.," "s. o. b.," "bastard." (In schizophrenia, one often observes phantasies in which the mother is a prostitute; that the patient's mother or both parents are not his real parents; that the patient is an illegitimate child. The phantasy of the mother as a prostitute with an incest situation was nicely shown in a drama played at the Empire, to wit, "The Lullaby.") Was there any truth in what they were saying? "Yes, it was true . . . it is true that I was a 'c. s.' " How often did you do it? "Twice. Once a year ago and then six months ago. *After the second time the people would look at me in a peculiar way on the street.*" (This was due to a guilty conscience. Compare with analogous feelings in normal individuals after they have masturbated.) "They would say: 'there goes a 'c. s.,'' and I also heard it at night when I was asleep" (it would not give him any rest). Do you feel sorry for yourself? "No." Did people do anything peculiar when you went by? "Sometimes people would point their fingers at me on the street and look at me in a funny way, then I would hear them tell the people they were with that I was a 'c. s.' " Subsequently the patient was at times restless and disturbed, refused to remain in bed, ran up and down the hall, necessitating restraint. Sometimes he was very irritable, abusive, and used obscene language. At times he was stuporous, but not cataleptic. He stated that he was indifferent to the

opposite sex; that he was more attracted to men. For the last four months previous to commitment, he has suffered from an uncontrollable urge to perform fellatio; this comes at irregular intervals. Two or three times a week he dreams of having incestuous relations with his mother. There are visual hallucinations of his mother coming through the window and sharing his bed. Two months before admission he thought that good looking men were following him for erotic purposes. He gave me a history of indulging in fellatio on two occasions. The first incidence occurred a year before admission while in a bath-house; the patient and another negro had just finished bathing and were standing naked. The patient had an erection and was suddenly seized with an uncontrollable desire to perform fellatio (in some patients the resistance and fear would have been so great as to bring on a cataleptic stupor. Certain homosexuals often impulsively attempt to gratify fellatio cravings in public baths.). He impulsively gratified his impulse. The second incidence occurred while playing "craps" at the home of his brother, when he observed the erect penis through the trousers of one of the players. He immediately became extremely passionate, made overtures to the man, and paid him for his services. The patient was perfectly conscious of his desire and felt very much disgusted with himself for having such abominable desires, but could not help it. At times he felt like amputating his penis (a punishment for incestuous and homosexual desires). The voices at times threaten to shoot or cut him up.

Here we have a young negro who was a latent homosexual (easily recognized by his inadequate reaction to heterosexuality) until a year previous to admission when he was accidentally placed in a situation in a bath-house which acted as a stimulus to his previously repressed homosexual impulses, already under great tension, and suddenly brought out a passionate longing, as it does in situations of this sort, which proved too strong for him to overcome. Even well adjusted homosexuals speak of a first incident or situation which overwhelmingly brought out homosexual passion that was previously unrecognized; in other perversions we get a similar history. The second gratification was also provoked by an erotic stimulus in the environment, and was followed by a feeling of disgust and guilt. After several months of residence the patient was deported to his native country. At that time he was very much deteriorated and had almost regressed to a hebephrenia. Diagnosis: schizophrenia paranoides.

In the above cases, a homosexual or an incestuous situation precipitated a schizophrenia; in the next two cases the psychosis appears to have been precipitated by a stirring up of the castration component of the Oedipus complex.

Case XI. B. G. Admitted February 6, 1923. Born in Ireland. Age thirty-eight. Common school education. Subway guard. Roman Catholic. The patient's wife stated that she had known him since childhood; that he was different from the other men in that he never seemed to have much interest for women. He married his wife six years before admission; she was said to have been his first love (in reality his mother was his first and only love). According to his wife the patient always suffered from ejaculatio precox and at times from complete impotence. Since the development of the psychosis he has manifested practically no interest in cohabitation. He always spoke a great deal to his wife about his mother. *In September, 1921, the patient had a tonsilectomy performed; two weeks later he became depressed, complained of headache, and brooded.* He imagined that his blood pressure was too high, and began to talk about dieting; said he was getting too fat. He imagined that his fellow employees were trying to get him depressed so he would have to give up his work. He struck and kicked his wife, and said she was as bad as the rest of them in trying to get him depressed. At times he sang and imitated a priest. He thought that a friend of his was a half-brother, and that his wife's sister was his half-sister; that he could raise the dead. He said: "They were performing a marriage on me, a secret marriage, I married my own sister" (his unconscious incestuous wish). Did men where you worked make nasty remarks about you? "Yes . . . they were trying to make me believe I had a bad mind . . . I laughed at them . . . it was only a joke . . . their presence never made me feel uncomfortable . . . I heard them calling me: 'c. s.,' 'fairy,' 's. o. b.,' . . . that's about the most I heard . . . they talked about this together . . . they did not have the spirit to come right up to me . . . someone told my wife that she was a blood relation of mine (the wife is a sister and mother imago), and that she would have no child." Diagnosis: schizophrenia paranoides.

Case XII. M. A. Admitted November 10, 1925. Born in Italy. Age thirty-eight. Common school education. Married. Iceman. Roman Catholic. Nothing could be obtained about the patient's early childhood. He married in 1906 and has six children. For the last five or six years previous to admission the patient has drunk whiskey to excess, becoming intoxicated once or twice every two or three weeks. He was always very friendly, sociable, frank, and open. In October, 1925, the patient was operated for a right inguinal hernia; he was doing very well until five days later when he suddenly began to scream, tried to get out of bed, talked in a loud voice, picked at his dressings. He could not be kept in the hospital any longer and was transferred to Bellevue. Here he was described as excited, tried to throw himself out of bed, and was extremely noisy. He said: "They have killed my sister . . . it is terrible . . . all are poisoned . . . I don't know what it is . . . where is my mother?" On admission to M. S. H., one of the physicians

asked him what had happened to him. He replied: "I went to the X Hospital to have an operation . . . that was done on Saturday morning at 10 o'clock . . . after the operation I started to scream as I thought they wanted to kill me . . . the pain I had hurt me badly so I screamed more . . . my head began to bother me . . . they killed my child . . . they took me away from my wife . . . they killed my sister." He was correctly oriented for time but not for place. There was a certain amount of confusion for recent events, *e.g.*, he gave his home address incorrectly, did not remember how long he was at X Hospital, said he was at M. S. H. for two weeks (actually only ten days). Subsequently he was often noisy, restless, and disturbed. His affect had a stiff quality about it; there was great irritability and constant reaction to auditory hallucinations. When visited by his wife and family he refused to receive them and became very abusive; would not accept the food they had brought him. After being in the hospital several weeks, said that he had been here for nine years; that he came to M. S. H. in 1923, and that therefore the present year was 1932; he could not give the month; said that he was forty-six years old (actually thirty-eight years), etc. He recalled being at Bellevue Hospital and coming to Wards Island in a boat. He showed marked confusion for temporal orientation. As a rule his emotions were inadequate, but whenever his complexes are touched, he shows sudden irritability. In discussing his case with him, he told me that while he was at X Hospital, *he heard three nurses, who were jealous of him, ask the doctor to amputate his penis*; this made him excited and he jumped out of bed. He said the doctor (father imago) wanted to do it for spite. He imagined that a man on the roof shot him in the heart; that he had received seventeen bullets (to be taken in a symbolic sense); that someone had given him poison in a nursing cup (symbolizing fellatio), and it made his tongue swell up (see Case VII). At times M. A. had auditory and visual hallucinations of God and said that he (the patient) would be punished (as a matter of fact he was punishing himself in phantasy with his delusions of being castrated and killed). He imagined that God (symbol for the father) was punishing him by sending him to M. S. H. He complains of voices coming from under the floor which threaten to kill him, cut off his penis, and blind him (see *Œdipus Saga*); to cut off his hands (punishment for masturbation with incestuous phantasies). He believes that he will get the electric chair; that he will become the victim of a pederastic assault. The voices call him: "c.s.," and "woman." At night an invisible woman comes to his bed and cohabits with him (an incest dream). He feels electricity in his rectum. M. A. said: "They put stuff in my food . . . and say I'm going to be in a family way (impregnation phantasy resulting from an identification with the mother) . . . someone puts semen in my food . . . I cannot see it, but it tasted like it" (a wish-fulfilling gustatory hallucination).

which is extremely common in schizophrenia). M. A. gave a history of being seduced to pederastic relations by an adult male when he was in his fifth and sixth year. He did not have very good appreciation of his surroundings, thinking that he was in a prison. Before coming to X Hospital for his operation, he had been drinking five or six whiskies a day. M. A. then escaped from the hospital and has not been heard from. Because of the history of excessive alcoholism, marked fear reaction, prominence of auditory hallucinations, acute onset, and a certain amount of confusion, the case was considered one of alcoholic psychosis—Acute hallucinosis; from the Kraepelinian standpoint this diagnosis was justified. But one could undoubtedly recall numerous instances where individuals who had drunk greater amounts of whiskey over a longer period of time than M. A. and yet never developed a hallucinosis; or individuals who had developed other types of mental disorder attributable to alcoholism. Alcohol in excessive amounts has a tendency to stimulate and then paralyze the psychic functions; the higher, last acquired ones are first affected, especially those which have to do with repression. In the case of M. A. the alcohol and the ether, received during the narcosis, produced changes in the psyche which allowed submerged impulses to enter consciousness in the form of neurotic symptoms and allowed a psychosis to occur acutely which might otherwise have developed in chronic form at some future time.

I feel that the acute alcoholic hallucinoses are merely aborted schizophrenias in which the repressed libido is to a large extent dissipated or abreacted in the form of fear. With Bleuler, I believe that there is no such thing as a chronic paranoid alcoholic psychosis; cases of this sort are really schizophrenias complicated with alcohol. The trends in both the acute and chronic alcoholic hallucinoses are practically the same as those commonly observed in schizophrenia; and many of them, after a period of observation, develop into a typical schizophrenia. It is well known that the alcoholic hallucinoses as a rule recover, only to come back to the hospital some time later following a spree; they are especially susceptible to small doses of alcohol. In these cases alcohol gives momentary relief to the emotional tension to which such complex-ridden persons are subject to; it allows a certain amount of transference toward males to take place which might otherwise be impossible. In the case of M. A. the combination of toxins and a katathymic situation, the operation, which was associated with a deep sense of guilt over incestuous impulses in childhood, punishable by castration, stirred up old emotions which had long been slumbering in the unconscious; it was like recalling an old mental trauma.

Case XIII. H. I. Admitted to M. S. H., May 19, 1923. Born in the United States. Age twenty-six years. Single. High school student. Salesman. Hebrew. As a child the patient was robust, healthy, and never displayed any mental symptoms. He was docile, happy, full of fun. H. I. never cared for women, in fact, expressed a dislike for them. He was always very much attached to his mother; his family looked upon him as a mother's boy. At fifteen he began work as a salesman, but would never work steadily in one place for any length of time. As a boy he played freely with his male comrades, but as he grew older he became shy and bashful, and would not associate with the male sex as formerly (due to a repression of homosexual transference). He was somewhat distant and "touchy," never confidential, frank, or open. To his family he seemed cold and unaffectionate. There was a tendency to be religious, but just prior to the onset of the psychosis he became almost a fanatic (a defense against his tabooed impulses). About a year previous to commitment his family noticed that he became unusually quiet, taciturn, and seemed to lack interest in things; he wanted to stay in the house all the time; became indifferent and neglected what friends he had; would pass them on the street without greeting them (a common schizoid or schizophrenic trait). He began to say that Italians were after him (a symbol which to him meant bad individuals, homosexuals, etc. It is interesting to note that the different nations tend to accuse their neighbors of originating homosexual practices: the Germans attribute it to the French; the French to the Germans; the Greeks to the Turks, etc.). He imagined detectives were after him on account of the Becker case (this had some katathymic or unconscious emotional significance to him). Sometimes he would look at the heavens and extend his arms upward in a suppliant manner. His brother told me that seven months before admission he attempted suicide with illuminating gas; and spoke of seeing two men at the window who wanted to do something sexual to him; that he ran and put the gas tube in his mouth. He was unconscious and therefore taken to X Hospital where he remained three or four days and was then transferred to M. S. H. At M. S. H. he was at times almost inaccessible, then again would answer questions slowly and hesitatingly after considerable urging. His answers were coherent and relevant. Emotionally he was depressed, especially for three or four months prior to commitment. He said that people on the street looked at him; that certain men thought he was a "c.s."; he expressed ideas of being poisoned and doped. *He stated that he noticed a change in himself a year previous to commitment (confirmed by relatives) following a homosexual dream (see Schreber case reported by Freud) with seminal emission; he dreamt of fellatio and pederasty.* At M. S. H. such dreams occur on an average of twice a week, but he has had them for the past year, preceding admission. When he received a lumbar puncture in the hospital he reacted rather severely, became

weak and fainted; said that it recalled certain hugging and kissing parties in childhood; that he felt he was being subjected to a pederastic assault (the patient says it was accompanied by a seminal emission). About seven months before commitment, H. I. said he had a vision of two men on the fire escape who wanted to force him to perform fellatio (the patient had spontaneously mentioned this hallucination to his brother before admission), he became frightened and attempted suicide by putting a tube which led to a gas jet into his mouth (a symbolic compromise symptom for fellatio), and turned on the gas. The patient admitted that he was conscious of homosexual feelings but did not think he is a "fairy"; he believes that some exterior influence causes him to have these feelings. At the age of ten he had homosexual relations with a cousin. Since that time he has not indulged in homosexual practices. Never has experienced heterosexual relations. Before coming to the hospital he had noticed that he had an erection of the penis at times when in close proximity to certain men. He imagined that someone called him: "King Tut"; that his father was dead; that he felt as though he were doped or poisoned "because they give me that stuff (referring to semen) every night and morning . . . it makes me vomit . . . it gives me electrical sensations about the genitals and neck" (refers to fellatio). The patient refused food several times and required tube feeding. Occasionally spoke of his relatives being dead and that he would never see them again. Diagnosis: schizophrenia paranoides.

In accordance with dream psychology, some incident must have occurred in H. I.'s waking state a few days preceding the homosexual dream, and, being associated with unconscious material, precipitated a dream as well as the psychosis. The urgency of the homosexual impulses can be judged from the homosexual dreams which he regularly experiences since that time.

Case XIV. A. L. M. Admitted September 14, 1924. Born in United States. Negro. University graduate. Age thirty-nine years. Married. Government employee. As a child displayed no nervous or mental symptoms. Not inclined to be religious. He was always a steady, efficient worker. His first marriage occurred when he was twenty-one years old; he cohabited with a girl before marriage, impregnated her, and then was forced to marry against his wishes. His passion for his first wife cooled down rapidly after he married her so that he did not care to have sexual relations with her. He does not recall whether he was impotent, although thought that he had premature ejaculations at times. They lived together less than a year; he then came North and they gradually drifted apart and were later divorced. He remarried in June, 1921. After the first year of marriage he suffered from

ejaculatio precox and at times was completely impotent; this did not worry him, however. After a year of married life he and his wife performed the well known "69" perversion, and since that time he has not felt the same toward her (this perversion probably threatened to bring an unconscious desire to indulge in fellatio to consciousness). He said that whenever he indulged in such sexual variations, his conscience bothered him. On one occasion, his second wife had him arrested because he threatened to cut her with a knife; it appears that he had received some powders in the mail, and thought that they were intended to subjugate him, at least that was what he read in the letter. He asked his wife about it and she flew into a rage, he became excited, picked up a knife and said he would chop her head off. He said that she had thrown a pair of scissors at him. The case was dismissed by the judge. In July, 1924, he definitely separated from his second wife. A. L. M. gave a history of indulging in homosexual relations several times in his life. He would never receive the penis himself; this was beneath him and against his sense of manliness. In 1910, while in a park (from my cases, Central Park in New York City is a common place for picking up homosexual acquaintances which often precipitates a schizophrenia in latent, unconsciously homosexual individuals), a man performed fellatio on the patient. After doing this act, the stranger put his tongue into the patient's mouth. On the following day the patient felt extremely nauseated and was unable to eat anything (this reaction was due to his own, repressed fellatio cravings. In schizophrenic patients we occasionally observe vomiting, refusal of food, and constant expectoration in reaction to homosexual phantasies.) In 1914, a negro performed fellatio on him and since that time he has indulged in homosexual relations at irregular intervals, but would never receive the penis himself. Since 1920, A. L. M. has been very intemperate, he would go on sprees lasting two or three weeks at intervals of two to four months. Temperamentally, he was jolly, happy, and sociable. He never liked to be alone and had many friends. A cousin said that a week before Christmas, 1923, he began to drink excessively, he consumed at least a half-pint of whiskey each day, and continued drinking up to a day before he was sent to Bellevue Hospital. The same informant stated that two weeks before commitment at Bellevue, he thought that somebody plotted against him and spoke of a frame-up. In January, 1924, while walking on the street he thought that men were looking at him; that they wanted to perform fellatio on him. In February his relatives took him to Bellevue because of his delusions and drinking. While there he was described as restless, excited, and attempted to indulge in homosexual relations with other patients. He said: "My mind is under the control of others . . . I could not sleep and my mind was not under my control . . . before I uttered my thought, people knew what I was thinking about . . . they could read my mind . . . I know my mind is under the subjection of

everybody." On admission to M. S. H., he was often observed attempting to play with the genitals of other patients, and for that reason was placed in a sheet for the first two weeks of residence here. After A. L. M. had recovered from his psychosis, he confessed to me that for the first time in his life he performed fellatio on a patient at Bellevue; he had an uncontrollable craving to do this act. Regarding drinking he said that for eight years he had been indulging excessively; that for two years he was accustomed to take a few drinks every day, and for periods lasting a month he would drink heavily. During Christmas week of 1923 he drank about a gallon of whiskey and following that a pint a day until his commitment (there is no doubt in my mind that there is an association between heavy drinking and repressed oral erotic cravings). He stated that he worked until the last week in January, 1924. A. L. M. then gave up his job because he thought that fellow employees made remarks about his sexual habits, to wit, the practice of cunnilinguis.¹² The following is a bit of conversation between the patient and the receiving physician: What led to your being sent here? "It was due to some unnatural contact with women." Just what do you mean, would you go down on them? "Yes." How long had that been going on? "It started four years ago." How did you get into that habit? "That's more than I can say; it's my nature to be so . . . I had been going with a girl and practiced that with her for a year." Did you practice that with your wife? "Yes . . . only once about two years ago." Is that why you could not get along with her? "Oh no . . . she went down on me before often and she did not object to my going down on her; but we could not get along, and she was spiritual and often had meetings and I did not like it . . . she would accuse me of going out and throwing her money away on other women . . . I presume it was through this spiritual stuff . . . I did not go with other women when I was with her." Were you working? "I worked until the last week in January . . . I was home after that." Why did you quit work? "Because I felt disturbed." In what way were you disturbed? "I thought people were unjustly dealing with me through insinuations regarding my personal habits." Who were they? "Fellows in my office." Is that why you stopped working? "Yes, sir." Did you have sex relations with men? "When I was nine or ten years old a fellow older than me enticed me into doing that; it came over me a week before I came here and I did that (refers to fellatio while at Bellevue), but before I never had a desire for it." Which manner of having intercourse gave you more satisfaction? "I cannot say that I got more satisfaction out of one way or the other; it usually was the 'head and tail' way that gave me quite a thrill." From my own conversation with the patient, it appeared that the patient's psychosis began quite definitely about two or three weeks prior to his commitment at Bellevue

¹² Approximation of mouth and vulva.

when, according to the patient, some fellow employees started the following conversation: "A fellow employee held a handkerchief to his nose . . . another fellow asked him why he put it to his nose . . . the answer was: 'To keep out the draft.' Then somebody said something about: 'If you stuck your head in a woman's c—t you would not use a handkerchief.' Another one said: 'A fellow who would kiss a woman's c—t is lower than a snake.'" "Later on he thought he heard a man say: 'I know fellows who pick up cigarette butts (cigarette is a penis symbol commonly used in schizophrenia) on the street.'" After these remarks it seemed that men made all sorts of remarks about him. He said: "It seemed that fellows would sit near me and would put their hands on their genitals . . . I felt like a slut on the street followed by a lot of fellows." The patient, after he had recovered from his psychosis, attributed the onset of his psychosis to the remark made by a fellow employee about a handkerchief. As I have already stated he completed the act of fellatio at Bellevue Hospital under the urge of an uncontrollable impulse. He cannot recall who his partner was or how he looked, the whole affair is somewhat hazy to him. The above conversation between myself and the patient occurred when all ideas of reference, influence, and persecution had disappeared, when there were no more hallucinations. He realized that he had been through a psychosis; discussed his homosexual relations very frankly, and appeared to have resistance only to receiving the penis himself. He did not realize that unconsciously he desired to play the female rôle in his sexual relations with men. The official diagnosis was: Alcoholic psychosis—acute hallucinosis.

In my experience I can recall at least two cases of latent homosexuals who indulged in homosexual relations at intervals, but would never receive the penis, and for that reason believed that they were not homosexuals; both cases developed a typical schizophrenic reaction with phantasies that gratified the repressed desire to receive the penis through fellatio; they both made remissions and are still out of the hospital. In one of these cases the psychosis broke out after a period of very intimate association with a homosexual who induced him to take narcotics (this habit probably assisted in bringing on the psychosis). The main trend in this case was that he had a tapeworm (symbol for the penis) in his abdomen which secreted semen in his stomach and spoke to him in the voices of his male friends. After several months of hospitalization he made great improvement, spoke frankly about his homosexual practices, even admitted at times wanting to perform fellatio on his homosexual comrades, but nevertheless would not realize that a desire to receive the penis was a part of his sexual cravings. In the case of A. L. M.

the unconscious fellatio cravings were controlled pretty well by occasional homosexual relations and cunnilinguis, both of which served to whittle down the tension of his unconscious fellatio cravings; this compromise gratification probably would have been adequate to prevent a psychosis if the resistances to his fellatio impulses had not been partially paralyzed by his excessive use of alcohol. The tendency to express his homosexual impulses, partially, probably account in a measure for his rather good make-up, and good comeback. In the case of A. L. M. I feel that the alcohol helped to produce a premature, aborted, schizophrenic reaction (officially known as an alcoholic psychosis—acute hallucinosis) in an individual who at best was none too scrupulous in his *ars amandi*. If A. L. M. did not have a certain amount of cyclothymic alloy in his temperament with a tendency toward extroversion of his impulses, I believe he would have developed into an ordinary case of schizophrenia. This case to my mind shows the fallacy of attributing a psychosis to alcohol exclusively without taking the whole individual into consideration. Much could also be done for an understanding of drug addicts if one were to consider the psyche of the individual case rather than the physiological action of the drug only.

Case XV. L. F. Admitted December 22, 1921. Born in the United States. Age fifty-six. Common school education. Married. Shipping clerk. Nothing is known about the patient's childhood. After leaving school he traveled a great deal and was considered a rover (Wanderlust is a symptom often observed in schizophrenics; they have a tendency to leave home for years without ever writing home or informing relatives of their whereabouts). Married at the age of twenty-nine years. He was always considered a peculiar man. After marriage he refused to introduce his wife to his mother. On the night of his marriage he would not stay with his wife (probably from fear of the defloration which in a case of this sort would of necessity be a rather trying situation), and told her that he had an engagement with Chauncey Depew who was to give him a position. Five months after marriage, his wife had to break up house because L. F. failed to contribute enough toward its support; he spent most of his money in racetrack gambling. For the past 27 years, however, he has worked steadily for a meat concern and was pensioned two years ago; then secured a position as shipping clerk from which he was finally discharged because he insisted on going home at unusual hours to find out what was going on at home between a boarder and his wife. He was always somewhat seclusive, had no friends, and never cared for them; never wanted friends to come to the house. He never confided in his wife. Always had a strong

antipathy toward the use of alcoholic drinks (an overcompensation for a desire to use them. Here we have just the opposite reaction to alcohol from that in the previous case). He never attended church until the beginning of his psychosis. Towards his wife and children he was not affectionate (if he had a son, the mother would naturally turn to her boy for emotional outlet. The father would not be able to make good emotional rapport with his son because of his [the father's] strong, repressed homosexual tendencies which might even tend to make the father hate his son. From such a situation, indulgence from the mother and conflict with the father, two camps are formed in the family household which easily might lead to an incestuous tendency in the son and, perhaps, a future schizophrenia which, on account of the father's schizophrenia, would be attributed to heredity by the old school of psychiatrists). The patient seldom went out with his family, was very irritable, and never a good provider. He always boasted a great deal about association with big men. Always thought he knew things better than anyone else. In September, 1920, a Mr. C. came into the patient's home as a boarder. L. F. was extremely fond of him, said that he loved him, tried in every possible way to make things pleasant for him; once even offered Mr. C. the use of his bed, while he volunteered to sleep on the floor. At times the patient would make breakfast for this boarder. A year later, in January, 1921, mental symptoms began to appear; he insisted on going to church every night with his wife and daughter, and said that he had not lived a good life. In February, 1921, he went to his sister-in-law to consult her about supposed illicit relations between his daughter and Mr. C. Once he asked his daughter if she was married to Mr. C., the boarder. He became very suspicious and came home at irregular hours to discover if there were any improprieties going on between his wife and C., during his absence. On March 27, 1921, while playing cards he fainted, because, according to his own statement, he saw his wife and Mr. C., come from the same room. He began to accuse his wife and daughters of being dope fiends (symbolic for fellationists. He is projecting his own unconscious oral erotic cravings upon his wife and daughter); said they were having illicit relations with Mr. C. On one occasion asked Mr. C. if there were anything going on in the house that he (the patient) did not know about; and when informed that there was not, he shook hands with Mr. C. and began to cry. About July 1, 1921, he would get up at night and say that he heard people in the house; he would search everywhere for the imaginary intruders. He was finally sent to Bellevue where he said: "My wife insisted on keeping a dope fiend around the house . . . I could swear he was giving dope to them and they were trying to keep it from me . . . at first he would go into the bathroom . . . after this she would go in . . . I would listen at the door and could hear paper rattling when she was

taking her dope . . . they had improper relations together . . . at night I would hear all kinds of strange noises when men were coming into the house . . . my daughter got doped too." At M. S. H. the patient was well behaved, sociable with the other patients and a willing worker. His conversation was coherent and relevant. His emotions were stiff and his facial mimicry vacant. He said that he was happy and denied being worried. There was a tendency toward evasiveness. Constantly tried to impress one how good he was and how bad his wife and daughter were. He continued to express the same ideas which he harbored at home and at Bellevue. He spoke of being able to smell dope (symbol for semen). Could you hear voices? "Certainly I could hear voices . . . that is what I got up for in the middle of the night." Could you smell the "coke"? "Yes . . . I got a whiff of it right up my nose . . . as soon as he would walk out of the bathroom . . . I would walk in and smell it . . . there was a crack in the bathroom door . . . I used to peek in and I would hear him snuff . . . put his hands up to his nose . . . and snuff it up . . . as he would come out, I would go in and get a whiff of it . . . before he went in he would be morose, when he came out, he would talk on any subject and was very lively . . . I could hear the paper rattling that he had the dope wrapped in . . . he would throw them into the toilet and pull the bell . . . I would have my slippers off so that I would not make any noise, and I would listen at the door . . . when my wife would go in she would throw a towel over the crack so I could not see what she was doing . . . that was what kept me up at night . . . I was my own detective . . ." As I have stated above, it was the patient who wanted Mr. C. to board in his household; that he was quite attached to Mr. C. at first. The patient's wife noticed that since Mr. C. came into their home, L. F. was sexually less attentive to her, in fact was impotent. The patient informed me that he suspected that Mr. C. and other men who visited him were having homosexual relations with each other. He thinks that they were "cokies" or "c—k-suckers," and that they peddled cocaine (symbol for semen). At night he was afraid that Mr. C. would come into his room and strike him on the head (symbolizes a homosexual assault, see case V). After being in the hospital for two years the patient retained the same delusions; but said he did not feel particularly resentful toward Mr. C.; that after all he was a pretty good sort of fellow. L. F.'s wife informed me that whenever Mr. C. visited the patient in the hospital, he always seemed glad to see him, but after he left the patient still mentioned the same delusions. L. F. told me that he suspected that C. was practicing cunnilinguis on his wife and daughter; he stated that Mr. C. probably said to his wife: "Here I have some nice powder from France (the French way) . . . take a whiff." How did the cocaine smell?

"Something like ammonia, causing a tickling of the nose (symbol for the penis)." How does the cocaine feel? "It gets into your nose . . . it feels like sparkling champagne in the nose . . . I smelled it on the towel . . . I noticed a white powder on the towel which evaporated." His associations to cocaine were as follows: "powdered sugar . . . white chalk . . . cornstarch . . . milky stuff . . . White lead . . . salt . . . white milk . . . snow . . . saltpeter . . . white oats . . . malted milk . . . flowers . . . white geranium, etc." The associations: "cornstarch, white oats (seeds) refer to the seminal symbolization expressed by cocaine; and milky stuff, white milk, refer to its symbolization of milk (mother's milk). The psychoanalytic school have traced the significance of fellatio to a displacement of a wish to suckle at the maternal breast, the penis being a symbol for the maternal breast and the semen, mother's milk. Diagnosis: schizophrenia paranoides.

L. F.'s delusions of infidelity would be explained by Freud as a warding off of his homosexual inclinations toward Mr. C., in accordance with the contradiction:

"It is not I who love the man—*she* loves him." And he suspects the wife in relation to the man whom he himself is tempted to love.

Case XVI. M. J. Admitted January 26, 1916. Born in the United States. Age thirty. High school education. Married. Salesman. Methodist. A sister is said to be neurotic and immoral; his father, intemperate. *The psychosis in this instance appears to have developed as a result of marriage.* Magnus Hirschfeld, a Berlin authority on homosexuality, tells us that many homosexuals first become conscious of their invert tendencies after marriage when they realize that heterosexual intercourse leaves them ungratified. The psychoanalytic school have called attention to the fact that the homosexual impulse of latent homosexuals can be intensified by ungratified heterosexual relations; this appears to have occurred in the case of M. J. His inability to adjust to a normal sexual life with his wife was obviously due to his latent homosexual and incestuous tendencies. The patient married about a year previous to his admission to M. S. H. Both the wife and the patient stated that they had never been able to have satisfactory sexual relations. M. J. attempted it several times, but became too nervous and had premature ejaculation of seminal fluid. He was very indifferent toward his wife, and often said: "Waste not thy strength on woman" (this is an example of the usual form of comforting rationalization). Nevertheless, he frequently masturbated in the presence of his wife. Whenever she reprimanded him for this and reminded him that he had a wife, he became

very irritable and told her to mind her own business. M. J. became acquainted with his wife in July, 1912; they kept company for five months, becoming engaged May, 1913, and married December, 1914. He was well liked by his employer because he was a good salesman. He would never go out at night with the other men. During the engagement period, the patient and his future wife were together frequently. He usually talked about business. M. J. was always shocked by anything the least bit vulgar (this was prior to the onset of the psychosis), and never used profanity. He broke his engagement twice because of the objections of his aunt (mother imago). Each time he quickly returned and begged for a renewal of the engagement. On one of such occasions he went to his fiancée's house at 5:00 A.M. to ask for her forgiveness. These indecisions of the patient became more marked as the time set for marriage approached. After marriage he made several attempts to indulge in coitus, but was unsuccessful; the last attempt occurred three or four weeks before his commitment. About four months after marriage his wife caught him masturbating, and thought he did this every night, they usually did not sleep together. When she did sleep with him, he would at times tell her to get out of out of bed and let him alone. In February, 1915, he lost his position, but for several months previously he worried because he imagined that his firm would fail (a projection of his failure at the business of marriage). Mrs. M. J. said that before marriage she did not feel that her husband was in any way peculiar, but immediately after marriage she noticed that he never liked to have visitors; was always afraid that other girls would put ideas into her head (a fear that she would become enlightened by other women as to her husband's sexual incompetence) and did not want her to talk with other women. He never attempted sexual perversions on his wife, but would talk to her about fellatio and cunnilinguis. After six months of married life began to talk to himself; laughed and cried without apparent reason; would lie in a tub of warm water for a long time. In washing his face would go over his face three or four times; would walk about the house and go to bed stark naked (his exhibitionistic tendencies); wanted to expose himself; was careless about his personal appearance and often had his trousers unbuttoned. Before marriage he was always very fastidious about his dress. He became very ill tempered, would swear at everyone, and called his wife a "bitch" and a "whore." At times he refused to give her money. He said he did not care to have sexual relations because it weakened him. He became angry at his sexual failures and blamed his wife for it; said that her genitals were too small. He began to talk about buying the Woolworth Building (a symbol for a gigantic, highly potent penis). He often said: "I'll get them." He laughed and talked to himself and imagined that someone was trying to

put something over on him. He was arrested about 2:00 A.M. one day for ringing door bells (I leave this for the reader's interpretation). He spoke of becoming a big man some day. On admission to M. S. H. he was seclusive, indifferent, rather prudish, and stated that he did not want to talk about sexual matters, saying: "I don't believe such things should be talked about." He said that he had never had any sexual intercourse with his wife; that he never had much desire for it, and whenever he did have such a desire, he "fought it off." He believed that sexual intercourse made him weak and that he was "conserving his energy for a nobler and higher purpose." He married because people had advised him to; he did not love his wife, and did not want to have children. He expressed ideas about dope and poison being in his food; men called him a "c. s." and a "peewee"; people read his mind. He frequently used neologisms. Concerning the content of his auditory hallucinations, he was very evasive, said he wanted to nourish and rest his lungs by not talking too much; that was why he was so quiet. When asked how he spent his time, he replied reluctantly: "I study the winds and tides of Hell Gate, because I am so fond of scientific subjects." Diagnosis: schizophrenia paranoides.

That repressed complexes can be stirred up by chance situations in the environment is not new to students of psychopathology. Jaspers tells us: "When once a strong reaction (normal or abnormal in type) was experienced as the result of a certain situation, there remains a tendency (to an individually different degree) for the same reaction to reoccur with the same strength upon smaller stimuli which lie in the direction of the same type of situation originally experienced, or upon stimuli which only in some way remind of it, finally upon all possible emotionally toned events whose relation with the initial experience is difficult or no longer to be understood."¹³ Freud has worked out this mechanism very ably for dreams. He has shown how apparently indifferent occurrences in the environment, having only vague emotional significance to material in the unconscious, may precipitate a dream a day or two later. When repressed emotional complexes are touched by something in the external world associated with them an emotional reaction may occur even in normal persons. A fellow physician, a neurologist, who happened to visit a friend one day, during the course of his visit asked the eight- or nine-year-old daughter of his friend to come and feel his pulse. The child proceeded to do so, but no sooner did she feel his wrist than she

¹³ Jaspers: *Loc. cit.*, p. 209.

unexpectedly burst into tears. The host then informed my friend that several years previously his wife had by chance discovered her daughter playing "doctor" with some other children and had severely reprimanded her for sexual misconduct. The experience had undoubtedly been repressed and, by association, the above situation again recalled the original one with its coexisting emotional reaction. In the prison psychoses a patient may repress or completely forget his unlawful act, so that he has no recollection of it. Any attempt to recall to his mind the memory of his misdeed, is met by a lively production of mental symptoms (Jaspers).

From a study of the foregoing cases, the author feels justified in concluding that schizophrenia, like the other neuroses, usually has a definite precipitating factor or situation (there may also be numerous contributory factors) which has psychological significance to complexes in a state of repression in the unconscious; such a precipitating factor, occurring in the outer world, may be an actual situation related to repressed ideas and impulses (*e.g.*, advances by a homosexual, etc.) or a symbolic situation of some sort (as the symbolization of the baseball bat in Case V) having now an apparent relation to repressed material, and again merely a vague relationship which can only be appreciated by one who has had experience with the psychology of the unconscious. From my observation, a homosexual setting in the environment¹⁴ which offers gratification in a passive form to the unconscious or even suppressed homosexual impulses (already under great tension) of the patient is the most common participating cause of schizophrenia in males. Situations which refer to incest, castration, or other elements of the Œdipus complex seem to precipitate a psychosis less frequently.

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CHRONIC ARACHNO-PERINEURITIS WITH THE SYNDROME OF FROIN

REPORT OF A CASE WITH A DISCUSSION OF PSEUDOTUMOR SPINALIS *

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Since Nonne (1) in 1904 first considered pseudotumors as a definite clinical entity, the conception has become fixed in the literature and many cases considered to belong to this category have been reported. With more exact clinical observation and pathological study, pseudotumor cerebri has been resolved into meningo-encephalitis, meningitis, serous meningitis, and other pathological conditions which had clinically more or less resembled cerebral tumor. (2)

The following is a review of the literature of pseudotumors of the cord and the report of a case which was at first considered to belong to this strange group.

Nonne's (3) original description of pseudotumors of the cord was based on certain cases giving the typical symptoms of tumor which entirely cleared up on arsenic and iodile therapy without operation. The symptoms subsided so completely that the patients were considered cured. Four patients in all were reported, one of whom was under lengthy observation. This patient had weakness of the legs, exaggerated reflexes, unilateral clonus and Babinski, a definite level of anesthesia and double sphincter disturbances. Under arsenic the patient completely recovered and after ten years was still well. The astonishing effect of the arsenic suggests syphilis or multiple sclerosis; the case having been seen before the Wassermann reaction. Boettinger, Henschen, Bruns, and Maas also described cases of this kind.

There have been no pathological studies made on these cases, nevertheless Oppenheim (4) supposed that they were real tumors which underwent regression. If regression were possible it is hardly likely that complete functional recovery could result after months of pressure.

Oppenheim reported three cases diagnosed as cauda equina

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tumors which revealed at operation no pathology of the cauda, conus, or of the meninges. The disease process steadily progressed after the operation but pathological examinations were not reported. In Oppenheim's experience the lower end of the cord was the favorite site for these unexplained cases, and he believed that small tumors were probably overlooked at operation or that a chronic myelitis or a neuritis of the caudal roots was the basis of the symptoms.

Among the so-called pseudotumors may be those seen only on microscopic examination. Oppenheim described a case which grossly revealed no alteration in the configuration of the cord nor tumor visible on the cut surfaces. Under the microscope an infiltrating tumor was discovered. This type of tumor may account for negative results at operation. It is evident that without histological studies it is not possible to exclude a neoplasm.

Circumscribed serous meningitis may result in symptoms of spinal cord tumor and the differential diagnosis be practically impossible. In 1903 Stroebe described a "Simple inflammation of the meninges with encapsulation of fluid within very fine walls." Adler,(5) reviewing the literature in 1908 attributed the first report of this condition to Schlesinger in 1898. In this country Spiller,(6) Musser, and Martin reported the first operated case. Mendel, Bruns,(7) Potts,(8) Munro,(9) and Roper (10) have also reported similar cases. In twenty-two spinal operations Krause (11) discovered serous meningitis six times.

In 1909 Oppenheim (12) described the appearance of serous meningitis at operation. On incising the dura, the blue arachnoidal membrane protrudes through the wound and usually spontaneously ruptures, giving forth a gush of clear fluid. The arachnoid is usually thickened and adherent to the dura or cord. Oppenheim then believed that pseudotumors were probably examples of serous meningitis from which spontaneous recovery is possible.

Horsley (13) in 1909 stated that in all cases of circumscribed spinal meningitis he found the cord to be smaller than normal. This he supposed was a spinal gliosis resulting from the increased pressure.

Any intramedullary disease may give rise to thickening and adhesions of the arachnoid with secondary enloculation of spinal fluid. Trauma even of a mild type, vertebral fractures or dislocations and vertebral disease, most commonly tuberculosis, may cause fluid accumulation. Vascular disease with local edema has been ascribed an etiological rôle as have infections such as influenza and gonorrhea.

In the majority of cases no etiological factor can be determined. Krause and Bruns believe that serous meningitis is usually a primary chronic inflammation of the meninges resulting in the formation of cystic spaces. Weisenburg and Miller (14) believe that serous meningitis may result without cord pathology and that it probably is a primary inflammation of the pia arachnoid with the formation of adhesions and subsequent stasis of spinal fluid.

The pathologic findings in the meninges vary greatly. There may be massive thickening with connective tissue and fibrin deposits or more usually a very slight clouding and thickening of the arachnoid. In many cases the macroscopic appearance of the meninges is normal.

Stephen (15) has described a case with the clinical signs of a conus lesion in which increased fluid was found localized about the conus as a result of a chronic inflammation of the arachnoid and the perineurium of the caudal roots. He termed this condition arachno-perineuritis chronica serofibrosa with secondary atrophy of the roots.

Caudal neuritis was mentioned by Oppenheim as a possible explanation of the so-called pseudotumors. In 1913 Elsberg and Kennedy (16) reported that five of eighty-four spinal operations for cord tumor revealed a neuritis of the lumbosacral roots. The clinical symptoms led to the diagnosis of cauda equina tumors. At operation a red blue discoloration of the roots was seen with marked swelling. There was no meningeal involvement.

I have only been able to find one example in the literature of a case with the clinical findings of a spinal cord tumor where careful histological studies failed to reveal any pathology whatsoever. This case was reported by Nonne (17) in 1910 at which time he knew of circumscribed serous meningitis and sacral polyneuritis.

The patient was a fifteen-year-old boy who fell severely on his buttox. For three months he had pain and difficulty in walking which gradually completely subsided. Three years later he developed severe pain in the buttox, spasticity, double sphincter disturbances, perianal hypaesthesia, and absent ankle jerks. The sacral spine was tender to pressure but repeated X-ray examinations were negative. The patient gradually became cachectic and died of a cystopyelitis. Necropsy revealed no findings whatsoever grossly or microscopically. Nonne believed that in this case histological methods were not fine enough to bring out the true pathology.

The history of trauma even though no changes in the vertebræ occurred suggests the possibility of serous meningitis which may give very mild histological findings and as such may be entirely overlooked.

CASE REPORT

Clinical History. A colored laborer aged thirty-five entered the neurological ward of the Cook County Hospital complaining of paralysis of the legs, pain in the back and inability to urinate. About eighteen months prior he felt a sharp pain in the lower lumbar spines and right hip, which often shot down the sides of his legs to his feet, more severely on the right side. During work which necessitated considerable bending the pain was absent. He became constipated and for two months used cathartics daily. The pain increased and although no urinary symptoms were present he was treated for chronic gonorrhea and stricture which he had had for twelve years. He felt as if there was a pressure and numbness inside his rectum. Three weeks before admission he noticed difficulty in using his legs, more effort was necessary for motion. For the last few days walking became impossible without assistance. The toes and feet became numb and hot flashes were felt down the legs. Thirty-five pounds in weight were lost in seven months.

The day before admission he went to a medical dispensary because of his pain. Examination then revealed tenderness over the sacrum and in the rectum and indefinite anesthesia on the inner surface of the right leg. The reflexes were normal and nothing further was found. When he returned home there was terrific pain in his back and legs which was relieved only by morphine. The next morning he awakened with excruciating pain over the sacrum which lasted fifteen minutes, then it suddenly disappeared leaving his legs completely paralyzed and devoid of all feeling. That evening he was brought to the hospital. He stated then that he had no pain save uncomfortable-ness in his lower abdomen due to the distended bladder and slight tingling in his legs.

Physical Findings. Examination revealed a robust well nourished negro. The urinary bladder was distended to the umbilicus and overflowed on change of posture, a catheter was easily passed through the urethra. Erection was impossible. Rectal examination revealed nothing abnormal. The vertebræ were tender to pressure from L4 to S2, worse at the higher level. The coccyx was not tender and there was no muscular rigidity.

The cranial nerves revealed no change. The upper extremities were normal.

The legs were completely atonic with complete paralysis of all muscles of the toes, feet and calves. The thighs could only be slightly abducted and adducted and the knees very slightly flexed, the

right side less than the left. There was no atrophy. Coarse fibrillations were seen in the calf muscles only. The external temperature of the extremities was normal.

The sensations for cotton wool, pin prick and heat and cold were lost over the same areas. This complete loss was saddle shaped over the buttox, over the posterior surface of the thighs and over the entire leg below the knee. The rectum, testes and penis were insensitive. The sensory loss was symmetrical and apparently involved the segments below L3. Deep sensibility, vibration and sense of position and passive motion were preserved to the ankle joint but were lost in the feet and toes.

The reflexes of the upper extremities were equal and normal and upper and lower abdominal response was present. The cremasteric, bulbo-cavernosal, and rectal reflexes were absent. The knee jerks were present but the ankle jerks were absent. Plantar response was flexion and there was no clonus.

Laboratory Findings. Spinal puncture revealed a fluid of increased viscosity (pressure was not measured) showing the syndrome of Froin. The fluid was canary yellow in color and transparent. Pandy and Nonne reactions were positive. There were thirty-two cells per cm., all erythrocytes. The fluid coagulated spontaneously on standing and then contained white strands of fibrin.

The blood and spinal fluid Wassermanns were negative. Urine and blood chemistry were negative. X-rays revealed only slight osteoarthritis of the lumbosacral vertebrae.

The diagnosis was made of a tumor, the upper level at L4, probably of the lumbosacral cord involving the cauda. An early operation was advised.

Course. On the fourth day in hospital during an examination, the patient complained of pain over his heart and became very restless. He suddenly became pale and lost consciousness. His entire body became rigid and vigorous clonic movements took place. The pupils were dilated and the head and eyes turned to the left. The movements stopped for a moment and then began again. The third time this occurred his respirations deepened, his pulse became imperceptible and the patient died.

Necropsy was performed six hours after death. The cause of death was not found in the body. The essential findings were a marked hyperemia and edema of the lungs. There was a latent tuberculosis of the pulmonary apices with healed tracheobronchial glands, and an acute cystitis and cloudy swelling of the kidneys were present.

The skull was normal, the dura unchanged and the sinuses patent. The spinal fluid was uniformly yellow but not increased in amount. The leptomeninges were clear and showed nothing abnormal. There were no softened areas and the cut surfaces of the brain were entirely without change.

The vertebræ and spinal dura were unchanged. The spinal leptomeninges were slightly thickened and opaque but were not adherent. The cord was of normal size and shape and contained no enlargements or discolorations. In the region of the conus the consistency seemed softer than normal and slight pressure easily distorted the shape. The cauda was entirely normal save for marked distention of the veins accompanying the roots.

Microscopic Examinations. The examination of many sections throughout the cord reveal no evidence of tumor, collections of unusual cells, or cavitation.

In the cord and spinal roots myelin stain reveals no change in the myelin sheaths. Scarlet R preparations reveal no increase in the lipid material. Because of lengthy formalin fixation, two and a half years, Marchi stain revealed many black globules in all sections. They were, however, much more numerous in the caudal roots.

Horizontal sections of the cord stained by Bielschowsky's method reveal many very thick and tortuous axones. Some of the smaller fibers are corkscrew-like. Many of the axones are seen to be fragmented, especially the tortuous fibers, while the large swollen fibers can be followed as such through many fields. Alzheimer Mann stain reveals the same thickening and tortuosity of the axones but show the absence of glial proliferation. Thin paraffin sections of the caudal roots stained after the method of Freeman (18) also reveal the axis cylinder changes.

The ganglion cells of both anterior and posterior horns contain pigment in excess of normal for the patient's age. Most marked is the presence of central chromatolysis in almost all the ganglion cells of the lumbosacral cord.

The nuclei are at the periphery of the cells and have dark staining chromatin. The cytoplasm stains a homogeneous pale blue and Nissl bodies are absent save at the periphery of the cell. These cells are globular in shape and their processes are visible for a long distance. Many ganglion cells are in the process of degeneration (Fig. 1). The Nissl bodies are clumped and diffusely stained dark blue. The nuclei are undergoing karyorhexis and there is a surrounding satellitosis and beginning neuronophagia. The glia are not proliferating.

erated but are progressively irritated. The satellites (Fig. 1) show regressive changes with dark staining pyknotic nuclei.

The pia is not thickened or infiltrated but there is an increased amount of green pigment. This membrane is normally adherent to the surface of the cord.

The arachnoid and perineurium (Figs. 2, 3, 4, 5), however, are severely altered. About the cord the arachnoid is separated from the

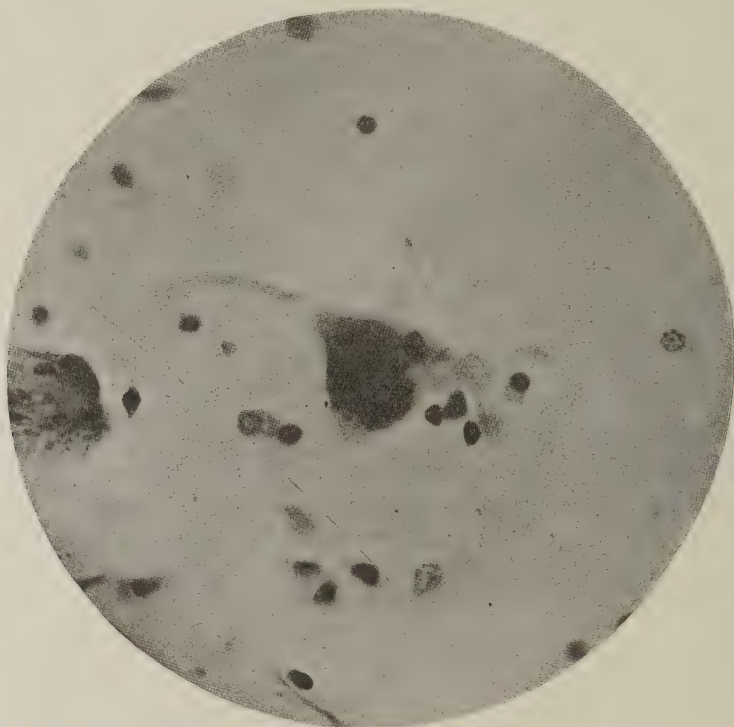


FIG. 1. Degenerating ganglion cells undergoing neuronophagia. The satellites are protoplasmic glia which reveal regressive changes. Toluidin blue stain, X650.

pia for a considerable distance and is broken up into several pieces. No trabeculations of connective tissue into the subarachnoid space can be seen. The arachnoid and perineurium are moderately thickened with connective tissue probably of collagenous type as it stains red with van Gieson, very faintly with resorcin fuchsin and silver stains.

The membrane is not dense but has a mesh-like structure resulting from interwoven short strands of broken up connective tissue. In

the meshes is considerable debris of connective tissue strands. The large blood vessels are markedly dilated and filled with crenated blood cells and blood pigment. Many of the distended vessels are broken (Fig. 3) and their contents lying free in the connective tissue meshes as granules of blood pigment. A large amount of amorphous material is found free in the tissue, and about the blood vessels.

The tissue is not excessively cellular. The normally present endothelial cells are noted and in addition a moderate number of

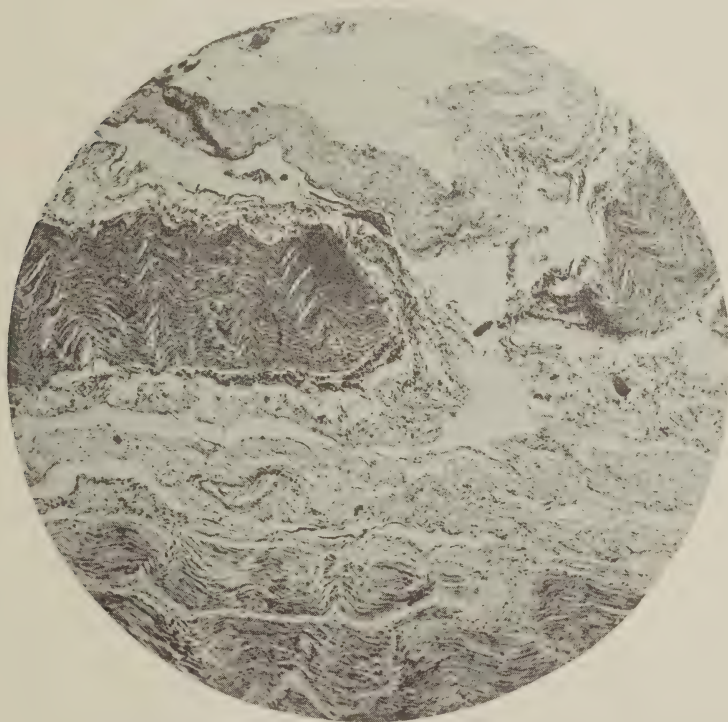


FIG. 2. A spinal root enveloped by thickened perineurium. H and E stain X60. large round cells. These cells contain large deeply stained nuclei with very scanty cytoplasm. Some of the nuclei are indented. Occasional macrophages are found. There is no perivascular infiltration.

COMMENT

The microscopic findings definitely reveal the absence of a cord tumor or medullary lesion of any significance. Certainly this case should have more right to the name of pseudotumor than any case in the literature. However, careful examination of the meninges

exposed the essential pathology. The arachnoid and perineural infiltration and proliferation, the distention of the connective tissue meshes which contained considerable old blood pigment, are definite evidences of a mild *chronic arachno-perineuritis*. On opening the dura at autopsy the arachnoid was not distended with fluid, nevertheless the distended fibrous meshes of connective tissue containing much debris suggest that fluid may have been present at one time

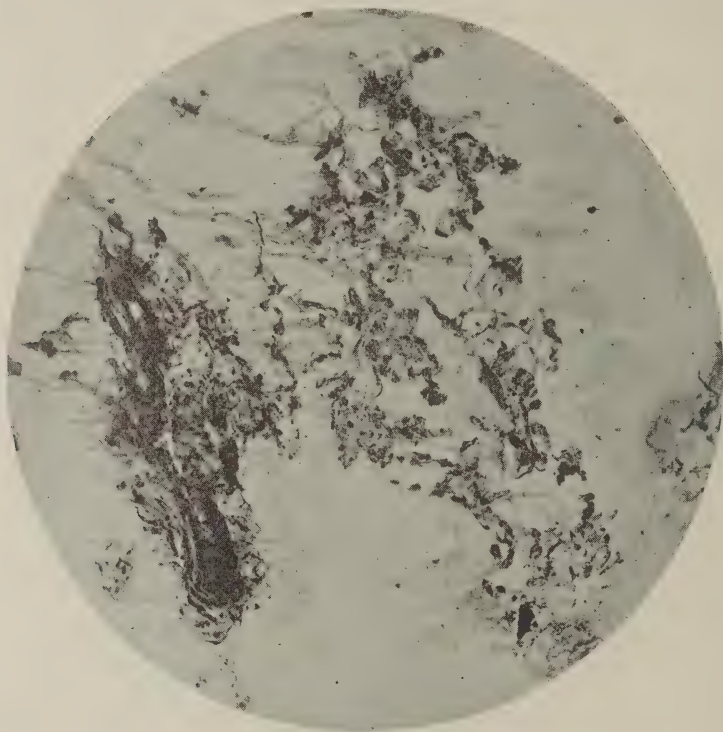


FIG. 3. The mesh-like structure of the arachnoid with fragmented connective tissue strands. A ruptured vessel is seen. H and E stain X140.

accumulated in the subarachnoid space. This is also suggested by the presence of the syndrome of Froin in the lumbar fluid.

The clinical findings of a severe flaccid paraplegia, bladder incontinence, and extensive sensory loss with a definite level, seems unlikely with such mild cord changes. I believe that the arachnoiditis and the possible accumulation of fluid were sufficient to cause a functional blocking of the roots involved without severe degenerative changes. There were, however, mild changes in the roots and cord indicative of beginning axonal degeneration. The axones of the roots and long

tracts of the cord were swollen and tortuous. The ganglion cells in the cord were swollen, some degenerated, and many revealed central chromatolysis. These changes are characteristic of beginning degeneration of the axones and nerve cells.

The lack of severe secondary changes in the cord may be explained by the acuteness of the process. For many months the patient had pains in the back and legs which probably were due to the arachnoidal

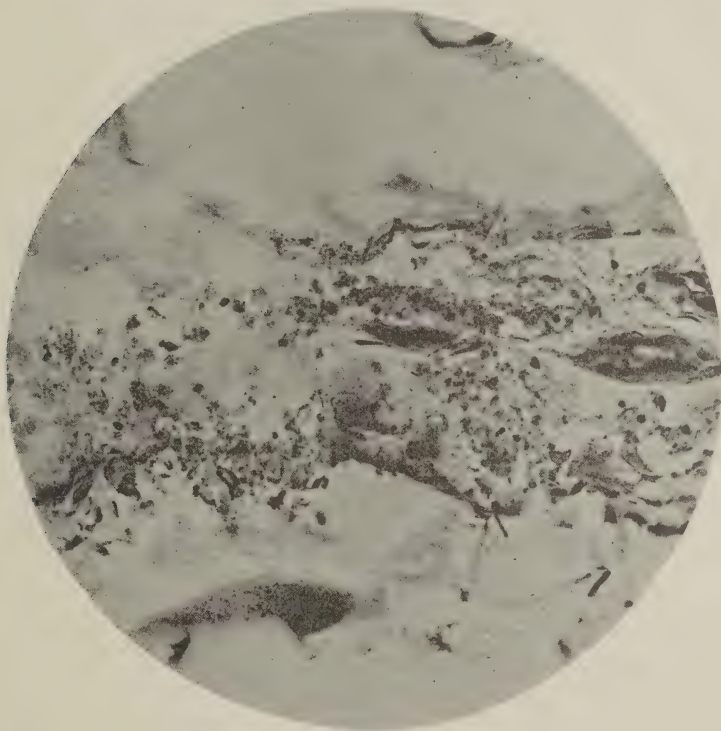


FIG. 4. Showing the debris and amorphous material in the arachnoid. Considerable old blood pigment is present. H and E stain X230.

and perineural inflammation impinging on the roots. The suddenly appearing paralysis, sensory loss and incontinence may be explained by a possible final blocking off of the arachnoidal space in the lumbosacral region by adhesions. The resulting accumulation of fluid and transudation into the subarachnoid space probably caused a block in the function of the roots. This was only of three days duration and therefore much in the way of degenerative processes could not be expected and correspondingly the flaccid muscles revealed no evidence of atrophy.

The cause of death is not easy to explain. Although one is forced to conclude from the appearance of the meninges that a circumscribed serous meningitis was present, yet at necropsy no local accumulation of fluid was seen. It was noted that the fluid removed from the cranial cavity as well as from the spinal canal was uniformly yellow. I believe that the delicate arachnoidal band enloculating the spinal fluid suddenly gave way. The rapid intermingling of the normal fluid

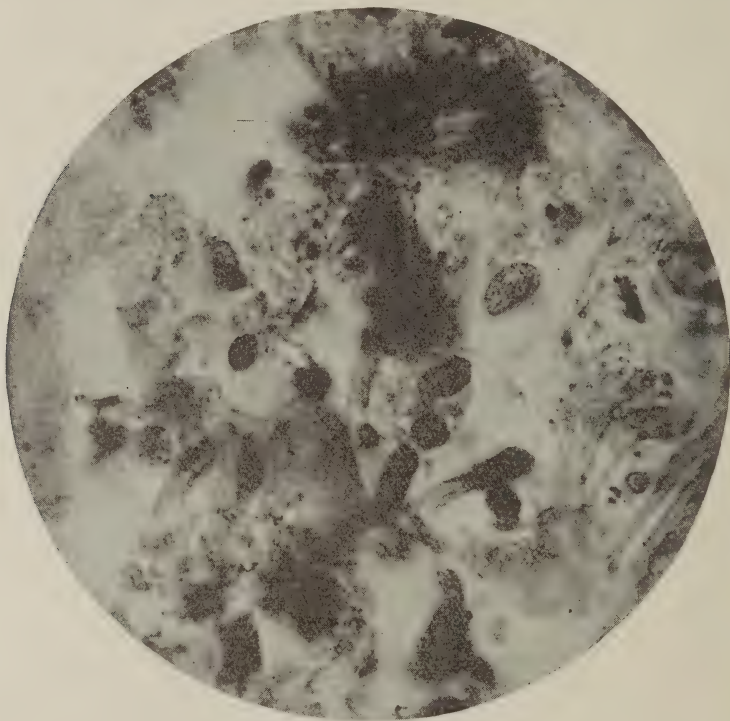


FIG. 5. The debris and hemosiderin may be seen as well as the large round cells in the arachnoid meshes. H and E stain X1200.

with the highly albuminous exudate probably resulted in a disturbance of the fluid equilibrium, which by a disturbance of the medullary centers might well have resulted in convulsions and sudden death with the findings of marked pulmonary edema.

The pathological changes were secondary to no change in the cord or vertebræ. There can be no doubt that the arachnoiditis was a primary affection as in many of the cases heretofore described.

The complete syndrome of Froin was present in typical form. Both yellow fluid and spontaneous coagulation were noted.

Mestrezat (19) believes that the syndrome is due to a *cul de sac* formation by meningitis, tumor, or vertebral disease, or by engorgement of veins below an inflammatory process. A block of cerebrospinal fluid is not essential to the production of this type of fluid since it has been described in Landry's disease and by Greenfield (20) in polyneuritis. Cushing and Ayer (21) believe that it may result from transudation of engorged veins in the spinal canal or exudation from a tumor surface and be present above and below the tumor level.

In the case here reported the seat of the pathology was in the arachnoid and that membrane in addition to revealing signs of a mild chronic inflammatory process had marked vasodilation and extravasation of blood cells. Vessels with broken walls were seen and red cells and much old blood pigment were present in the tissue. There is every reason to believe that transudation from these vessels into the spinal fluid took place.

The differential diagnosis between serous meningitis and spinal cord tumor is extremely difficult especially in this case where Froin's syndrome was found, since this is usually attributed to tumor. Horsley believed that in serous meningitis the pain is more diffuse and spread over the entire limb while in cord tumors it is limited to the roots involved by the neoplasm. Weisenburg has shown that this criterion does not hold. A shifting level of anesthesia in serous meningitis has been suggested as a differential point. This may be of service in some cases but pressure of a tumor on the cord may give rise to varying amount of edema and varying amounts of fluid compressed and thus a shifting sensory level.

Nonne's case of pseudotumor spinalis is the only one in the literature of which careful examination was made. It may be suggested at this time in the light of my case that the pathology may have been meningeal. I do not, as Nonne does, consider that our histological methods are not fine enough to reach the essential pathology. Rather do I believe it a result of pathologists expecting as the cause of striking symptoms, very gross and striking pathological findings. I feel that we are apt to consider as normal, mild but unmistakable variations from the normal.

The word pseudotumor is to be condemned. Either a tumor is found or some other disease process is present, provided of course that the clinical findings are definitely organic. Any disease with organic neurological findings, particularly those of the spinal cord, I believe must be related to a morphological change in some portion of the tissue. Findings are often reported which are considered too mild for the extensive clinical symptoms. The error probably lies in

the absence of proper evaluation of those findings however mild they may be.

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POSTENCEPHALITIC RESPIRATORY DISORDERS
REVIEW OF THE SYNDROMY, CASE REPORTS AND DISCUSSION

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OF NEW YORK

(Concluded from page 527)

QUESTIONS OF THERAPY

The views here set forth point in many directions regarding therapy. A few of these may be briefly considered.

There is little doubt as to the exogenous causal type of factor in inducing the acute onset, even though one may not be satisfied with any of the as yet isolated organisms and adopt Jahnel's dictum in this respect. For ourselves we are in agreement with this statement in spite of the work of v. Wiesner, Rosenow, Loew and Strauss, and Freeman's¹ more recent findings, apparently confirmatory of v Wiesner's original studies. So far as the stimulus from without is concerned we rest with the assumption that *there is something*, organism or virus, which activates the process.

What this organism or group of organisms is, or may be, is not the concern of this communication, although no causal therapeutic means of combating the disease in the large sense is thinkable, unless a better appreciation of this very factor is obtainable.

It has been frequently and justly emphasized that epidemic encephalitis is an extremely grave disorder. Not grave alone because of its initial mortality, which conservatively has been estimated to be about 30%, but even more pernicious and malignant by means of after results which bring about prolonged invalidism and death in from five to ten years in at least six out of every seven of the 70% who certainly not providentially have been spared the initial lethal results. Under present means of control, then, happy may be considered the lot of those who die.

The aggregate of after resulting invalids is very large. Freeman,² in his paper before the American Neurological Association, has quoted from English sources,³ at least 5,000 cases were reported

¹ Evans & Freeman. Studies on the Etiology of Epidemic Encephalitis. I. The Streptococcus. Public Health Reports, 41, 1926, 1095.

² J. A. M. A. 87, 1926, 1601.

³ London Letter—J. A. M. A. 85, 1925, 529.

in 1924 in England, and innumerable small epidemics have occurred in the United States and other countries. Thus the therapy, so far as the larger issues are concerned, is one full of significance, since malignancy is the rule rather than the exception.

Experience, thus far accumulated, seems to show that the parkinsonian syndromic evolution represents the most malignant of the chronic situations. As yet, complete analysis, statistically, affords few certain figures as to the prevalence of this outcome. It is by no means small, and is to be seen chiefly in sanatoria, psychiatric wards and mental hospitals. The behavior disorder group, especially when the initial onset occurs in childhood, is certainly not less appreciable, even if hidden behind police courts, criminal activities, or lost in the records of our hundreds of state hospitals for mental disorders. The vast medley of other forms of involvement to which our respiratory forms belong is too well known to need citation.

The lesson to be learned from the clinical records certainly points towards some factors of chronicity, which from one point of view reminds one, analogically at least, of the persistence of the treponema activity in such chronic types as paresis or tabes dorsalis.

But, just as psychiatric science is still dumb concerning the factors relevant to the possibilities of persistence of spirochetal activities in paresis and tabes, so also in the chronic or postencephalitic syndromies one is left much in the dark as to why the later developments come about.

There are observations, it is true, from the pathological disciplines that are not altogether irrelevant in this situation. In paresis and in tabes one finds evidences of a persisting inflammatory character: so also in malignant cases of epidemic encephalitis which have come to autopsy, indications of persistent inflammatory reactions are not wanting. The studies of Lévy, Scholtz, Hohman, Meggendorfer, Wimmer, and lately of Freeman, to cite but a few, are positive in this respect. Freeman's contribution collects some of these.

What this other factor or factors may be is definitely submerged. Whether dispositional (here meaning ontogenetic factors) or constitutional (here meaning phylogenetic factors) remains a problem for the future.

At all events I find no pertinency in raising a purely academic discussion as to whether one should speak of chronic encephalitis, or postencephalitic syndromies. Certainly the paresis analogies are not of much service, for definitely paresis is not *alone* a chronic treponema situation, else why should practically all of the later students of paresis, Kraepelin, Plaut, Kolb et al., be searching for the

unknown x in bringing about the more specific type of syphilitic disease we call paresis, to say nothing of the metasymphilitic conjectures of previous decades. But as stated, here is to be found no attempt to settle these questions.

Only one point needs remain in the foreground, and that is that unquestionably certain cases must be regarded in the light of a chronic inflammatory process, and that this process needs more light to be combated.

Certain statements have been made concerning this already, but supposing one were faced with a patient, such as either one or the other of the cases here reported as samples. What shall be done? To even list the many things that have been done would be to make divine providence grin and say, "What fools these mortals be." Milk injections, protein injections, serums galore, belladonna, hyoscine, scopolamine, luminal, autohemotherapy, influenza antigen, sodium nucleinate, urotropine, salvarsan, neosalvarsan, silver salvarsan, electrargol, cacodylate of soda, malarial organisms, argotropine, morphine, codeine, veronal, allonal, cicutine, arnica, inulin, cutting the sympathetics, the phrenics, spanking, cold douches, electrical sparks, surgical operations on appendix, on brain, on thyroid, locking them up, disciplining; a vast medley of means indicative of man's incompetencies and "magical" efforts to compel "cure" through his inadequacies to read the secrets of nature behind a disease process! One cannot condemn one for trying things, however, in view of the malignancy of the process.

I have seen cases in which each of these procedures has been tried, or recommended, and where "fools rush in where angels fear to tread," all to no avail. Thus in a patient of fourteen with pronounced "behavior disorder," with a respiratory syndrome, read this fragment of a letter from a presumably competent head of a sanitarium:

"If I could only resort to the old-fashioned style of punishment with her, I know it would do her good."

"If I was as severe with her as I should be they would think I was cruel and inhuman, but she certainly does require sharp discipline, and I feel that is her one hope."

Is not this reminiscent of the Middle Ages and the methods of curing witches? Nay, even more antiquated—since in pre-Hippocratic medicine they tried to chase out devils by noises, by stinks, by chains and other force measures. One might just as well fancy

himself a Joshua and command a measles eruption not to appear, or prohibit the formation of a swollen Peyer's patch, or a tuberculous hemorrhage—as attempt to treat these patients by “coercing them” —“breaking their naughty habits”—or by disciplinary measures, etc., etc. Unfortunately some morons still can prosper in the medical profession.

So the conclusion that is first to be drawn from these few remarks is that one needs to get a sympathetic understanding of what is going on in these patients with damaged brains in order to hope to get anywhere.

As Hughlings Jackson has so well said of aphasia, the patient is doing the best he can with the well part of his brain that is still functioning, so our encephalitic cases are doing the best they can with those pathways which are left open for functioning.

Both the positive and negative aspects of functioning must be duly valued, and dealt with accordingly.

In view of our utter inadequacy at the present time to control the process, in spite of some seemingly brilliant results obtained from time to time, in most of which that have come to my attention, however, one is unable to really judge of the final outcome, since so many patients make an apparently excellent recovery from the acute phases, followed, it may be many years later, by the onset of the sequels, other considerations force our attention in another direction.

Turning to the *soil* in which this activation takes place, the material at hand permits hardly more than conjecture or speculation. Since neither conjecture nor speculation are to be feared or spurned, but if controlled may offer possibly the only real method in science for advance, we are not loath to utilize them. Many considerations have been advanced concerning the subtle constitutional backgrounds assumed to facilitate the reaction. Up to the present time I find none satisfactory.

But it is not our purpose here to deal with the acute situation. We are concerned with the chronic types, and more particularly those showing persistent respiratory disturbances.

These latter, however, make a thoroughly artificial group from the usual viewpoints. If one utilizes the psychoanalytic conceptions here spoken of under psychopathological considerations, it may be conceivable that these respiratory cases may be considered as a group—but even this is doubtful, and from the available material cannot possibly be proven as yet.

Certainly the myoclonic tic types of breathing disturbance are not to be allied with the majority of the respiratory forms here discussed.

They may be isolated, however, and attention be called to a temporary relief obtained in some of these cases by phrenic freezing, as reported by Muller, Procter and Gamble (*l.c.*).

The respiratory situations develop in all types of people. Just as "Mrs. O'Grady and my Colonel's Lady are sisters under the skin," all people are alike at a respiratory level. To argue that artificially delimited types with such opprobrious titles as neurotic, psychopathic, hysterical, hereditarily disordered, etc., etc., is, we believe, a rationalization born of ignorance. It belongs to the Morel "degenerée" era of generalization. Even Kretschmer's or other similar anthropological body formation type conceptions offer as yet no vantage ground for understanding predisposition. "Schizoid" and "syntonic" conceptions serve little better. The psychoanalytic study of "disposition" as revealed through character formation factors is the one lead which seems to offer some understanding of the situation.

Hence our chief reliance is based upon as wise an application of psychotherapeutic principles as may fit the grade of damage—somatically speaking, in the machine.

Should the results of the damage show through some evident or even highly complicated endocrinopathy it is quite conceivable how a specific and intelligent hormone therapy can bolster up a somatically damaged organ, or its neural mechanistic control apparatus.

Our knowledge of the switchboard of the vegetative nervous system in the mesencephalic and related regions is widening rapidly and a host of visceral deficiencies of various grades of intensity are showing up. The literature is large, and I shall simply refer to Schoenemann's¹ most recent contribution.

Through such intensive study useful facts may be found through which one can bolster up some impaired organ activity, either by a substitutive prop or by relieving it of excessive functional necessity. Thus a large number of encephalitis cases show liver involvements—(10% as estimated). After determining, if possible, the grade of functional loss, an adequate adjustment may be made possible—dietary or hormonal, or what not, as future study may reveal. Other organs are similarly implicated, peripherally and centrally. To the possibilities of central implication of visceral pathways I have called

¹ Schoenemann. Funktionsprüfung innere Organe bei Folgezuständen nach Encephalitis epidemica. Zeit. f. d. g. N. & P. 105, 1926, 175.

attention ever since Wilson made his initial contribution, and all of us know somewhat of Claude Bernard's "picure."

But the psychoanalytic findings reveal an extremely interesting situation. Namely, that the organism is doing the best it can with the parts of the body still capable of functioning. Function, in a sense, is crowded over a fewer number of pathways. In a rough metaphoric sense, the traffic has to be handled by fewer lines, since so many of the tracks are blocked temporarily or permanently, or the switches won't work to disperse the energy advantageously.

Attention has been called to the effects of "regression," and to the workings of the "repetition compulsion," because by the loss of dynamic capacity (partly in Janet's sense of the lowering of physical energy—metaphorically, however, only), the higher pathways of sublimation are either somatically blocked, or dynamically non-traversable, because of the low level of economy of expression—hence the utilization of the low level respiratory pathway to handle specific libido situations. These may arise from time to time from the environmental stimulus plus the stimulus from within, *i.e.*, the instinct drive.

Hence the great value in therapy that may result from a character analysis type of psychoanalysis.

The respiratory behavior is but one of the symptoms even in the so-called "respiratory" cases. In point of fact all of these patients manifest behavior anomalies, usually quite pronounced, especially antecedent to the development of the respiratory syndrome. In a most specific sense we are inclined to believe that the more typical respiratory forms, such as Case II for instance, may represent a last trench of regression. Further regression would result in dissociation and a psychosis would ensue. As is well known, shorter or longer psychotic dissociations frequently occur; they are either of the nonproductive, narcoleptic, epileptic or tic types, or they are more pronounced and assume manic, depressed, schizoid or catatonic features.

These behavioristic accompaniments also demand some psychotherapeutic consideration, for although the most outstanding manifestation may be the breathing, the other features are there and are often difficult to handle. Anyone who has attempted to analyze any of the "so-called" "behavior" type knows what devils such individuals may be with their sudden impulsive violent outbreaks, which may last but a few seconds or persist for hours.

Our remarks about disciplining these cases, locking them up, etc., may be re-emphasized. We have seen such cases go through acute

dissociated psychotic reactions under such misguided therapy, reminding us strongly of the picture so well depicted by Galsworthy in his play, "Justice." Sadistic attitudes even supposedly subtly disguised behind soft gloves and smiling faces, only bring about even more pronounced sadistic encounters with katatonic hate syndromes. Most hospitals have removed straitjackets even for manics. A discipline of empathy correlates is an entirely different thing. This becomes real education, in the *e-duco* sense, and is the only discipline that really avails. Some attributes of the Super Ego system have been damaged and their reappearance in others is a red rag to a bull to these patients.

To prod and poke these individuals out of bed gets nowhere. The behavior of Case I, even to mild promptings to stand up straight, is typical of the whole group reactions to this disciplinary method and has been narrated elsewhere in this study. Without wit or humor these patients cannot be helped, and nothing is more stupid than getting a nurse or companion who lacks a sense of humor.

Other behavioristic anomalies may be dealt with in the general analytic treatment. They come out in the course of the analysis. Thus in Case I the roots of the staying in bed repetition compulsion were revealed. They were overdetermined. As the different determiners came into the conscious field their dropping out of the picture caused marked amelioration in the conduct. Case II, a severe regressive situation, has made no progress in this regard up to the present time. Her narcissism is almost as profound as a schizophrenic, and months if not years may be required to recondition her pleasure principle reactions.

The Super Ego control in Case I relinquished somewhat, in that masturbation ceased to be regarded as so heinous, at the same time being more readily controlled. Even heterosexual contacts took on an entirely different internal aspect. They were less compulsively sought in phantasy; self-denial was more effective and outlets of a more artistic nature handled the urge very satisfactorily after analysis. Singing was encouraged and thus gave added outlet to the respiratory libido. Certain breathing techniques may be of service here, but I have my doubts about their ultimate issues. As in Yoga medicine, they may cause displacement of the symptom and bring about adjustment with perversions, or even mystical psychotic situations. The patient's conduct may be better, but their creativeness may be damaged.

Much more might be added along these lines, but as the present purpose does not contemplate any discussion of psychoanalytic technic we close with the statement of the conviction that a psychoanalytic mode of approach to these cases offers the most hopeful avenue for success.

We do not entertain the illusion that it will master all of the cases—many have suffered such great brain injury that they are practically nontreatable save by such restrictive measures as sanitarium for social reasons, or by drugs such as luminal or their ilk for reasons of medical inadequacy.

SOCIETY PROCEEDINGS

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MEETING, MAY 20, 1926—DONALD GREGG, M.D.,
PRESIDENT, IN THE CHAIR

SCIATICA

DR. M. N. SMITH-PETERSEN

This paper offers evidence to support the contention that sciatic neuralgia involving the first and second and occasionally the third sacral nerves is caused by lesions involving the sacro-iliac joints. The evidence offered may be summarized as follows:

1. The condition is comparable to pain of the same type involving other joints (brachial neuritis, referred pain from hip joint disease).

2. The innervation of the sacro-iliac joint from the first, second and third sacral nerves will logically account for the distribution of so-called sciatic pain.

3. The mechanics of the joint are such that it is susceptible to slight traumata.

4. Proved tuberculosis of this joint gives rise to symptoms parallel with those produced by trauma of the same joint.

5. Microscopic examination of joint cartilage removed by operations shows definite changes consistent with the traumatic lesion.

6. X-ray findings, when present, are also consistent with a condition of sprain of this joint.

7. Operative arthrodesis of this joint and of this joint alone relieves the subjective symptoms of so-called sciatica permanently.

8. "Sciatica" may be produced by operating on this joint, if faulty technique is employed.

These arguments correspond very closely to the tenets of Koch's law, as applied to the pathogenicity of bacteria, and represent fair evidence of the pathogenicity of the sacro-iliac joint.

Discussion: Dr. E. W. Taylor: Do you include all cases of sciatica?

Dr. Smith-Petersen: I stated in my introductory paragraph that this paper deals with so-called essential or idiopathic sciatica; that is, cases where there is no demonstrable lesion. Of course, there are cases where we find a pelvic tumor, or demonstrable pathological conditions in relation to the sciatic nerve, which will account for the "sciatica." But in so-called essential or idiopathic sciatica I feel the sacro-iliac joint is the etiological factor.

Dr. J. B. Ayer: Dr. Smith-Petersen referred to a case I had seen. Owing to the shortness of time he did not touch on one of the

important aspects of this case, namely, a markedly incontinent bladder, associated with severe sciatic pain. Another consultant was strongly of the belief that the patient suffered from spina bifida, which diagnosis, as also that of cauda equina tumor, could not be substantiated on thorough investigation. It was thought, also, that she might have tuberculosis. Following the operation the patient became nearly free from pain and coincidentally, and perhaps the most important improvement so far as she was concerned, was with reference to the bladder which greatly increased in tone so that a residual of sixteen to twenty ounces was brought down to one or one-half an ounce. This association of bladder incontinence with sciatic pain in sacro-iliac disease is an extremely interesting one. Another case which I saw had a rather similar picture, but I have not the final report yet. I wonder if Dr. Smith-Petersen has covered the whole range of idiopathic sciatica. I have a feeling that all are not due to sacro-iliac disease, but I am satisfied that this condition does explain a very large number, so many in fact, that I believe we should consider sacro-iliac pathology as the cause until proved otherwise.

Dr. Smith-Petersen: Dr. Ayer has mentioned certain additional points regarding one of the cases with which he is familiar. This particular patient was operated upon a year and a half ago. Her activities are normal; her residual urine is materially reduced. Her residual urine before the operation was approximately twenty ounces; at present it varies from one-half an ounce to four ounces. In the group of cases reported four had urinary retention, relieved either by conservative nonoperative treatment or by so-called radical operative treatment. Since the innervation of the bladder is derived from the second and third sacral nerves, and the innervation of the sacro-iliac joint is derived from the first, second and third sacral nerves, there is a distinct relationship in the innervation of these two structures which may account for the symptoms occasionally present.

Dr. H. C. Solomon: If the patient has had rest with a cast, is that a satisfactory form of treatment? or is arthrodesis more satisfactory?

Dr. Smith-Petersen: I absolutely disapprove of a spica in the treatment of sacro-iliac lesions. The plaster spica produces muscle atrophy and stiffening of the spinal joints, as well as the hip joint. It sometimes gives relief from pain, but this relief is, as a rule, temporary, the pain recurring on removal of the spica. A spica never overcomes a sacro-iliac relaxation. Personally, I never use that method of treatment; it is illogical.

COMPARATIVE ANATOMY AND NEUROPATHOLOGY

DR. B. BROUWER (Amsterdam)

My intention in what follows is to lay stress on the opinion that an exact knowledge of the relations in lower animals is valuable for the morphology and physiology of the human nervous system. I shall begin with the cerebellum. In the older literature, the human cerebellum was divided into a middle part, called the vermis, with

flocculus, and the lateral parts, known as the hemispheres. Elliott Smith, Bradley, and particularly Bolk, divided the cerebellum differently. In studying several classes of mammals, they preferred a transverse division, while the former was sagittal. After these publications, Edinger, however, brought again the sagittal division to the foreground. He distinguished the paleocerebellum, which is composed of the vermis, the flocculus, and the paraflocculus, from the neocerebellum, consisting of the hemispheres. He did not limit himself to the mammal group, but studied all classes of vertebrates. In fishes and amphibians, reptiles and birds, the paleocerebellum only is found. In the lowest groups of mammals the neocerebellum appears. There it is very small but grows bigger in higher mammals, being largest in man.

Such were the different views held when I got the opportunity of forming a personal opinion regarding this problem. I saw the brain of a man who during life had never shown any cerebellar symptoms. He died suddenly and at the postmortem examination, I found that the left side of the cerebellum was totally atrophied. The brain stem and the cerebellum were examined in a complete series of frontal sections. The atrophy of the cortex cerebelli was limited to the left hemisphere, the vermis, flocculus, and paraflocculus remaining normal. This atrophy was exactly limited to the neocerebellum of Edinger. Afterwards I saw other brains of this type. They belong to the group of neocerebellar atrophies of H. Vogt. Not infrequently pathological processes followed the newer or younger parts of the central nervous system. The idea has forced itself on us that these newer parts are less resistant against noxious agents.

About the same time, the ontogenetic studies of v. Valenburg, made at Amsterdam, showed that the growth of the cortex cerebelli in the human foetus differs in the neocerebellum and in the paleocerebellum. The various layers of the cortex begin to ripen in the paleocerebellum; the neocerebellar part comes later. The latter's results and mine, as you notice, agree with those of Edinger. You can thus understand how the idea of a paleocerebellum and a neocerebellum appealed to me. Recently Marburg and Winkler have advanced arguments against this conception of Edinger. One of my pupils, Dr. Koster, who studied two cases of neocerebellar hypoplasia in my laboratory, has given full data about different opinions in this matter. I refer to his book.

The brains of neocerebellar atrophy I used to increase our knowledge of other parts of the brain connected with the cerebellum. I shall select as an example the system of the inferior olives. These consist of large groups of cells, which send their fibers to the cortex cerebelli by the tractus olivo-cerebellaris, which chiefly proceeds to the opposite side. These inferior olives degenerate when the cortex of the cerebellum is destroyed. Now I found in two cases of pure neocerebellar atrophy that the degeneration did not extend over the whole inferior olives. The system of the inferior olives in men is composed of a principal olive, very large in man, and of two accessory olives, a dorsal and a medio-ventral. In these just men-

tioned cases of neocerebellar atrophy, the accessory olives were spared, together with the oral part of the principal olives. These findings gave me the idea that both these accessory olives must send their fibers to the paleocerebellum, and by far the greatest part of the principal olive to the neocerebellum. Hence it was necessary to divide the inferior olives into an older and a newer part. I was strengthened in this idea through studying brains of monkeys, dogs, cats, and rabbits. In these animals, the principal olive is relatively small, and the accessory olives comparatively large. Careful investigations in comparative anatomy by Kooy and by Brunner have shown that the medio-ventral accessory olive is the oldest part of the olive system, that then the dorsal olives develop, and later on the principal olive. I show you here some of Kooy's results in mammals. From these, it is plain that the accessory olives are relatively large in lower mammals, while the principal olive gradually grows bigger in the ascending scale. A comparison of Kooy's results and mine shows that they largely agree, and further that the principal olive grows in an oral-caudal direction.

At the present stage of science, we do not know much about the physiological significance of the inferior olives. Recent experiences point to their having to do with motility. It may be expected that the system of the inferior olives will play a rôle in diseases of the extra-pyramidal systems. Clinical and experimental investigations have shown that the function of the neocerebellum differs from that of the paleocerebellum. Hence we may be sure that the physiological significance of the older part of the inferior olives differs from that of the younger. From these observations, you may get the impression that the combination of pathological and comparative anatomy benefits both branches of science.

ORGANIZATION OF SENSIBILITY

My second example is of more direct clinical interest. It is the organization of the sensibility. Important work on this bit of study has been done by Head and his co-workers in England. In their opinion, there are three chief means by which stimuli for sensibility are caught up in the periphery. The first is deep sensibility which originates chiefly in the muscles and in the joints. By this, impulses produced by pressure and by movements are conducted to the central nervous system. The other systems conduct stimuli caught in the skin and in the subcutaneous tissue. These systems are the protopathic and the epicritic. The former respond to painful cutaneous stimuli and to the extremes of heat and cold. The latter serve for light touch, for discrimination of two points, and for appreciation of the finer degrees of temperature. In coöperation with one of my pupils, Dr. Schoondermark, I examined at Amsterdam many lesions of the peripheral nerve in men and studied their recovery. We have verified many of the facts described by Head. Our investigations, however, did not convince us that the existence of two distinct pathways for protopathic and epicritic sensibility has yet been proved.

But we felt that this work is a great advance in science, especially because autonomic sensibility has been brought to the foreground. In Head's opinion, protopathic sensibility is closely connected with centripetal sympathetic fibers. It is true that this centripetal side of the autonomic nervous system has not been so closely analyzed as was the centrifugal by Langley, but still we know several facts to work with in physiology and the clinical examination. Huber has proved that in the walls of the blood vessels there are many unmedullated sensory fibers. When stimulated by pinching the blood vessels during an operation under local anaesthesia, severe pain is often felt by the patients. Recently Leriche and Tournay in France have shown that sensory impulses may indeed be conducted by sympathetic fibers.

All the sensory stimuli experienced in the periphery of the body are sent to the spinal cord and to the brain. For a better understanding of the matter, we shall limit ourselves to the spinal cord. The same line of thought may be followed concerning the sensibility of the head. Thus the stimuli for touch, pain, temperature, and the proprioceptive sensibility reach the intravertebral ganglions and then proceed through the posterior roots. Ranson found that there are many unmedullated fibers in the posterior roots. He believes that these conduct the protopathic sensibility of Head. In the spinal cord these stimuli proceed chiefly through two separated pathways. One group reaches the gray substance of the same side of the spinal cord, and here the first sensory neurone ends. A new neurone issues in the cell of the posterior horns. It mostly crosses and proceeds upwards in the anterolateral part of the spinal cord. The other group divides the gray substance and avoids the posterior column of the same side. It ends in the nuclei of Goll and Burdach, which lie at the upper border of the spinal cord. Here it is that a second sensory neurone begins, crosses the oblongata, and ascends to the optic thalamus. The investigations of Petré, Fabritius, Head, and v. Valkenburg have made us well acquainted with the physiological significance of these two systems. The sensory pathways in the posterior columns of the spinal cord conduct stimuli of deep sensibility and a part of the tactile impulses. The other system comprises the stimuli for pain, heat, cold, and the remaining part of the tactile sensibility. Many investigators considered the sensibility of the posterior columns as a higher form, the so-called gnostic sensibility. The other form serves more for feeling and is more vital in character. These facts and opinions have led me to make a study of the development of the sensory system in the scale of evolution. In the lowest classes of vertebrates (in fishes), the system of vital sensibility is present. The posterior columns, however, are very small here and conduct only fibers connecting the different levels of the spinal cord. These animals have only this vital sensibility, which we may call the paleotype of sensibility. As soon, however, in the scale of evolution as life on land has become possible, new demands are made on sensibility. Thus the new pathway is formed. This is the system which we call the gnostic sensibility.

In lower animals, for example, in reptiles and in birds, this second pathway is still small, but in the ascending scale this pathway grows and is as great as in man. I call this the younger form of sensibility, or neosensibility.

The results of my investigations in comparative anatomy seemed to establish the opinion that the sensibility of the posterior columns is a higher form because it is younger in phylogenetic development. More recent investigations, however, have shown that the paleosensibility does not remain the same during evolution. Just as is so often seen in the central nervous system, the older parts develop further and are more finely organized in higher animals and in man. (Ariëns Kappers.) The posterior horn of the spinal cord in reptiles and in birds is much simpler built than in man, and the *substantia gelatinosa Rolandi*, for example, is not present there. Hence, I believe it is not correct at the present stage of science to speak of a higher form of sensibility, which is conducted in the posterior columns, and of a lower form which is conducted in the anterolateral columns. In my opinion, the chief difference between these two forms of sensory pathways is the following: the so-called vital or paleosensibility is closely connected with autonomic functions and, as I have mentioned already, much of it is brought to the central nervous system by unmyelinated fibers. At all events, it is associated in the gray substance with sympathetic centers and there causes, amongst other things, reflex movements in the sympathetic area. The other form of sensibility proceeds through the posterior columns and avoids the gray substance, this field of association with sympathetic centers. It sends collaterals to this part of the spinal cord but does not terminate there. The impulses, sent in the direction of the cortex cerebri, do not originate in the autonomic nervous system and are not associated with it. They should be called nonautonomic.

Hence we reach the following conception about the organization of sensibility in the central nervous system. The sensory stimuli are spread through the spinal cord and the brain in two separate systems. The former is the vital system, closely connected with the autonomic system. It is composed of some long and many small tracts, very complex in build, and enters the cortex of the brain in a diffuse way. The principle of an exact localization is not found here. On the contrary, these stimuli are diffusely spread throughout several parts of the central nervous system. By this system, sensory stimuli are conducted for vital sensibility which on a high level of the brain may cause sensory feelings. The second is a nonautonomic system. It is composed of tracts of simple build and enters the cortex of the brain in a circumscribed area. This organization bears the stamp of an exact localization. In this system, impulses are conducted for gnostic sensory functions which at a high level of the brain may cause sensory observations but no sensory feelings. It is clear that both these forms of sensibility always work together in the cortex cerebri, and that they constantly interact. It is this constant separate coöperation that enables us to form some ideas of the outer world, so far as this is possible by sensory stimuli. The question arises now

whether a somewhat similar division into a nonautonomic and a vital part may be found in other senses; for example, in smell, taste, hearing, etc. The analysis of the finer relations in the brain do not at present permit of our following this line of thought, especially as a more exact knowledge of the central autonomic fields is not sufficient. But there is one function of which we are sure that such a sharp division is present, namely the function of sight. In lower animals, for example, in fishes, by far the greatest part of the optic stimuli proceed to the mid-brain, where many autonomic centers lie. Several autonomic reflexes are organized here and coöperate with reflex movements of the striate muscle system. But in higher animals, a large part of these optic fibers avoid the mid-brain. A new pathway is made, bringing the optic stimuli to the cortex cerebri, without seeking any connection with the autonomic centers. This non-autonomic pathway is the great radiation from the external geniculate body to the cortex. Thus, in the optic system we see the same grouping of stimuli in two separate pathways just as in the case of sensibility. It cannot be fortuitous that this is so evident in the optic system, for we know that the function of sight is the most frequent cause of exact observation.

[Demonstration of diagrams and lantern slides.]

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Eppinger, H., and Hofer, G. SECTION OF THE N. DEPRESSOR IN ANGINA PECTORIS. [Society of Physicians in Vienna, April, 1923.]

The report of section of the N. depressor in angina pectoris was preceded by comment upon the views held regarding the pain in this affection and the irradiation of the pain in the region of the ulnaris of the left arm. Observations do not support the assertion made that the coronary vessels always show alterations in case of angina pectoris nor do they testify that the pain is due to stimulus upon the nerves of the heart. The view has obtained support that the pain is a pain of the aorta, an "aortalgia," not a heart pain. The aorta is supplied by the N. depressor not by the sympathetic. The N. depressor being found to be a nerve which goes to the aorta, not the heart, and carries the impulse for lowering blood pressure, perhaps that for bradycardia. Its ganglion is the jugular ganglion.

On this basis it was determined to attempt control of the pain of angina pectoris. The findings of former anatomists were examined and new researches made until the course of the N. depressor was worked out. The nerve was found to spring from the N. laryngeus superior or the vagus itself and to run down as a fine small fiber. Some investigations revealed branches starting from the vagus or N. laryngeus superior, which sometimes sank again into the vagus to reëmerge lower. The operations were as follows: Aug., 1922, a patient suffering severe irradiations of pain in the left arm and unable to work had the left nerve severed. He was without pain until December when painful parathesias developed in the left arm. (II) Four months after section of the nerve on both sides the patient was still free from attacks though he had suffered for five years from stenocardiac attacks and was unable to work. (III) A forty-nine-year-old man with severe syphilitic aortitis and aortic insufficiency. Severe pain for two years. A few days, after double section post-paralysis set in, first on the left, later on the right side. Tracheotomy and bronchopneumonia led to his death. (IV) A woman with intensive pain free from attacks for the last two months. No depressor was found on the right side. Sometimes complains still of painful contractions in the arms and slight stabbing sensation in the breast. (V) Patient had only just been operated upon on the second side,

so no full report could be made. The pain in this case had irradiated to the palm of the hand. (VI) A man of seventy-three who had suffered intensive pain and been unable to work had been in good health since operation on the left side. Other patients operated upon were not reported.

Local anesthesia is recommended with a technic which takes account of the varying course of the fibers constituting the depressor nerve. The blood vessels must be kept free. One can distinguish the nerve from the arched N. laryngeus superior. It might be confused only with the ramus descendens hypoglossi which was also severed when doubt existed. Possible confusion with the N. phrenicus must be avoided if one is following the nerve upwardly. The accessories cannot be confused with the depressor since the latter follows the blood vessels in the upper breast aperture while the former goes to the muscles. The operation is free from danger if one operates on each side and thus avoids the post-paralysis.

Recht, G. THE VAGUS COMPRESSION TEST. [Klin. Woch., Vol. III, May 20.]

Changes of respiration after compression of the pneumogastric are here recorded by the author who has observed dyspnea with deep respiration, which changed into apnea of short duration after the release from pressure. The disturbance is chiefly reflex, but direct changes in the brain circulation, caused by the simultaneous compression of the carotid artery and jugular vein, may be implicated.

Sézary, A. BRONCHITIC ASTHMA AND OCULOCARDIAC REFLEX. [Bull. d. l. Soc. Méd. d. Hôp., April 13, 1923.]

This is an interesting case report of a gassed soldier who developed severe bronchial asthmatic attacks with unconsciousness after the cough. The oculocardiac reflex was strong. The attacks disappeared after treatment with atropine, but the nature of the oculocardiac reflex was not altered.

Imre, J., Jr. ENDOCRINE ORIGIN OF PRIMARY GLAUCOMA. [Arch. Ophth., May, 1924.]

In twenty-seven out of thirty-one cases seen by Imre, the close connection between endocrine disturbances and glaucoma was made highly probable. Examination gave, in several cases, strong evidence of an abnormal state of the endocrine system.

Byrd, Hiram. MECKLE'S GANGLION AND GLAUCOMA. [Jl. Fla. Med. Ass'n, Aug., 1923.]

Byrd assumes with Lagrange and others that glaucoma is at bottom a neuropathology, in which the offending nerve excites hypersecretion into the eye, and that when this happens to be coupled with poor eye drainage, the result is an increased intraocular tension.

Evidence is then offered that the offending nerve is Meckle's ganglion. He cites that Magitot and others have shown that irritation of the iris excites increased intraocular tension; and then cites Sluder's thera-

peutic evidence that there is a direct nerve path from Meckle's ganglion to the iris, so that a Meckle's irritation is, or may be, transmitted directly to the iris, thus causing an increased intraocular secretion, and except when this is adequately provided for by good eye drainage, increase of intraocular tension necessarily follows.

He also cites three cases very definitely worked out that illustrate different phases, as follows: Case A, is an eye with poor anatomical drainage, but with no symptoms of glaucoma till thirty years of age, when a nasal catarrh involving Meckle's area was followed by glaucoma, which could be controlled either by cocainizing Meckle's ganglion, or by using eserine to improve the drainage. Case B, is an eye with good drainage but with a chronic nasal catarrh, and no history of glaucoma till atropine instilled into the eyes interfered with drainage. Case C, is a case of Meckle's disturbance caused by closure of the maxillary ostium brought on by nasal turgescence, and followed by the classic symptoms of acute glaucoma, but promptly and repeatedly relieved by any astringent applied to the middle turbinal space.

Altogether the evidence presented that this ganglion is at the bottom of glaucoma, to say the least, is very striking. [Author's abstract.]

Clarke, J. T. ERYTHROMELALGIA TROPICA AND ANTIMONY. [Jl. of Trop. Med. and Hyg., Sept. 15, 1923.]

Thirty cases of tropical erythromelalgia were treated by this observer by injecting 1 grain of antimony tartate, diluted in 20 minims of water, into the muscles of the buttock once a week. All of the patients have been benefited; most of them are cured. Some have required six, some have been cured with two injections.

Houssay and Marconi. HYPERTENSION FROM SPLANCHNIC NERVE. [Rev. d. l. Asoc. Méd. Arg., Dec., 1922.]

In dogs a stimulation of the splanchnic nerve causes a discharge of epinephrin which is sufficient to raise the blood pressure and contract the vessels of a denervated leg. They are not observed when the suprarenal vein is clamped. Similar effects are noted if the animal is given epinephrin.

Brown, G. O. EXERCISE AS A BONE-MARROW STIMULUS. [Jl. Exper. Med., XXXVII, 187. Med. Sc.]

In the experiments detailed in these papers dogs were used, as their red cells are specially susceptible to mechanical injury. After being caged for several months they were exercised on a treadmill for two periods of two hours, with an hour's rest between each period, on successive days; the average distance travelled per dog per day (in four hours) was 3.8 miles and an ascent of 6,870 feet. For blood volume determination the vital red method of Keith Rowntree and Geraghty was adopted. Dogs of 10-15 kilos received 4 c.c. of a 1 per cent solution; if over 15 kilos in weight 5 c.c. of a 1 per cent solution of vital red was injected intravenously. The standard color for comparison was 1 c.c. of a 1 per cent solution made up to 250 c.c. with distilled water. After puncturing the vein 2-3 minutes was allowed to elapse before the intro-

duction of the dye, and the blood was withdrawn 4 minutes later. The plasma for colorimetric readings was obtained by centrifuging at 2,000 revolutions for 10–15 minutes. Epstein's hematocrit was used at 3,500 revolutions for 30 minutes. Hemoglobin determinations were made by Newcomer's method. "Pigment volume" is the product of blood volume by percentage of hemoglobin (Whipple).

After 10–15 minutes' active exercise a slight increase in plasma volume (3.6 per cent) and a marked increase in cell volume (12.3 per cent), hemoglobin (8.5 per cent), pigment volume (16 per cent), and a number of red cells per cm. (11 per cent) was found to have occurred. After several hours' exercise the average plasma volume increase is 11.7 per cent above the resting value. The cell volume shows an increase of 9.4 per cent above resting value but a decrease of 2.9 per cent below the average of 10 minutes' exercise. The hemoglobin decrease is more marked, and the pigment volume shows a 7.7 per cent fall below the average after 10 minutes, but is still 8.4 per cent above the preexercise period. The erythrocytes show a marked decrease after prolonged exercise.

From this it appears that the initial concentration of blood during exercise is not due to loss of fluid, since there is no decrease in plasma volume; fluid is taken from the muscles. Initial increase in total cell volume is not due to swelling of cells, since hemoglobin is increased also; it results from redistribution of those present in the body, and the individual cells may become larger.

After 3–6 consecutive days' exercise there is a distinct fall in cell volume—18 to 25 per cent—an actual decrease in volume of circulating cells. An increase in plasma was found at the end of the days of exercise, which may be an effort to maintain the total blood volume.

Recovery takes place in 1–3 weeks; some dogs develop a plethora.

A great decrease in total circulating hemoglobin and red cell volume occurs in dogs long maintained under sedentary conditions when they are exercised vigorously during several consecutive days. This would appear to be consequent on increased blood destruction unrepaired for the time being.

If exercise of caged animals produces such a well marked decrease in red cell quantity as the blood volume observations indicate, the demand for corpuscles to replace the loss should be reflected in an increase in the number of reticulated cells. To determine if any increase of reticulated cells occurs as a result of exercise a different series of dogs was used, which had been caged for 1 to 4 months before being put to treadmill exercise. Robertson's method of enumerating reticulated red cells was employed. Ten thousand cells were counted in each instance, and the number of reticulocytes found in 10,000 furnished the count of the animal. Great individual differences were noted in the normal number of reticulocytes, but the variations occurring in the same animal from day to day, while considerable, were less marked.

A rise in the reticulocytes occurred in an irregular fashion sometimes during the first day or two of exercise and was often followed by a fall and subsequent rise. In practically every instance the crest of the rise

was reached after exercise had been discontinued, and the count remained relatively high until hemoglobin and cell count had returned to normal limits. Replacement by transfusion of blood destroyed during exercise prevents the reticulated cells' reaction. Exercise must be an important factor in the maintenance of an efficient hematopoietic tissue.

Animals recently caged do not show as large a decrease in cell volume after exercise as those which have been confined several months. When a dog kept for some months under sedentary conditions is exercised daily for several weeks a decrease in cell volume occurs in the first and second week of exercise, but usually by the end of the third week the loss has been made up and the hematopoietic tissues have adapted themselves to the increased demands made upon them by the increased rate of destruction.

At autopsy the weight of the spleens was considerably greater in the exercised animals than in the controls, and greater than is usual in normal dogs. In 10 normal animals caged for several months the spleen averaged $1/444$ of the body weight as compared with $1/272$ for 3 exercised animals, and the amount of real marrow was considerably greater in the latter.

Kreibich, C. SURGERY OF ANGIONEUROSSES. [Klin. Woch., Vol. II, Feb. 19.]

Cassirer in his monograph argues that the angioneuroses are largely irritative rather than paralytic phenomena. The present paper tends to support this notion. The cells die, he thinks, because of a vasomotor anemia and not from disturbances of trophic nerves. He found that a blister contains approximately blood serum (more proteins than an inflammatory exudate). His conception of trophic nerves is a little old fashioned or very modern; it is hard to say which. Certainly few believe in the old fashioned trophic nerve functions. Leriche's periarterial sympathectomy may act also centripetally, and should be tried in Kaposi's pigment sarcoma and other affections of the skin. It is possible, that a unilateral operation would be sufficient. He cites a case of psoriasis which disappeared on the side of the body on which the ulnar nerve was injured by a bullet, and other cases showing that there may be centripetal action.

Lenaz, L. ON EMBRYONIC BLOOD FORMATION AND ITS SIGNIFICANCE FOR THE PATHOGENESIS OF PERNICIOUS ANEMIA. [Beitr. z. Path. Anat. u. z. allg. Path., Vol. LXXI. Med. Sc.]

According to the author a subdivision of blood formation into phases is erroneous, and one should, instead, distinguish between primary and secondary blood. The primary blood arises from a "system of islands" concerned with the production of megaloblasts only. The term "system of islands" applies to the whole of the tissue which has the structure of the blood islands of the yolk sac. A tissue of this sort is found not only in the yolk, but also in the pedicle of the allantois, in the mesentery,

and chiefly, in the "intra-acinous blood formative foci" of the liver. The secondary blood arises intraembryonically and extravascularly from the reticular connective tissue or mesenchyme of the pericapillary spaces from which normoblasts and leucocytes originate. These are at first produced all over the body of the embryo, then only in certain organs, and finally in the bone marrow alone. The mesenchyme concerned with the production of normoblasts may, therefore, be defined as the "normoblastic blood organ," while the blood islands form altogether "the megaloblastic organ." This undergoes a process of physiological involution, but never disappears entirely, and may enter into a phase of fresh activity ("status megaloblasticus") in certain pathological conditions such as, for instance, pernicious anemia, which may, therefore, be conceived as a "primary atrophy of the normoblastic blood organ" associated with a status megaloblasticus.

Brüning, F. SURGICAL TREATMENT OF ANGINA PECTORIS. [Klin. Woch., Vol. II, April 23.]

A report of a successful extirpation of the cervical sympathetic in angina pectoris. He observed lowering of the blood pressure from the operation.

Freeman, L. OPERATION FOR RELIEF OF CARDIOSPASM. [Ann. of Surg., Aug., Vol. LXXIX. J. A. M. A.]

In Freeman's case beginning just above the cricoid and extending further down behind the sternum than the finger could reach, the esophagus was uniformly dilated into a great, slack, thin walled, sac like tube, around which the examining finger easily could be swept within the mediastinum. Freeman pulled upward on the dilated tube until a large fold, including the entire circumference protruded through the incision in the neck, and the portion below was rendered quite taut. There was no difficulty in accomplishing this, owing to the surprisingly loose manner in which the esophagus seemed to hang within the mediastinum. It was decided to invaginate the upper segment of the loop into the lower, without opening its lumen, thus restoring to the tube something of its proper length and longitudinal tension. This intussusception, maintained by means of a few stitches of chromic gut, formed such a bunch in the esophagus that, fearing its complete occlusion, a stomach tube was passed and left in place for a few days. Up to the present time, twenty years later, he has had no return of his trouble, except an occasional slight dysphagia.

Lagrange, H. GLAUCOMA AND ENDOCRINE DISTURBANCES. [Présse Médicale, April 5, 1924. J. A. M. A.]

Lagrange reports a case in which a young woman suffered from attacks of glaucoma and displayed, in the intervals, several symptoms suggestive of endocrine disturbances. She improved after corpus luteum

therapy. Experimental parenteral injections of distilled water caused in rabbits ocular hypertonia due probably to a colloidoclastic change in the tissue fluids in general and in the aqueous humor in particular. This condition is closely akin to urticaria, asthma, Raynaud's disease and spasmodic coryza. It seems that these conditions are connected with a temporary upset in the balance of the pneumogastric and sympathetic regulation.

Glaser, F. SYMPATHECTOMY IN ANGINA PECTORIS AND ASTHMA. [Med. Klin., April 13, 1924.]

Glaser explains the results of sympathectomy in angina pectoris by the supposition that the sympathetic contains centripetal fibers. Resection of the depressor nerve in aortalgia acts in a similar way.

Hohlbaum, J. PERIARTERIAL SYMPATHECTOMY. [Mitteil. a. d. Grenzgeb. d. Med. u. Chir., 1924. J. A. M. A.]

This communication from Payr's service gives a long list of pathologic conditions in which Leriche's technic has given remarkable results. Payr has even applied it recently in a case of growth disturbance following poliomyelitis. Hohlbaum states that it has completely failed in certain cases of vasomotor disturbances after injury of nerves, in some cases of malum perforans, and in Raynaud's disease, and it scarcely ever succeeds in treatment of arteriosclerosis. To date, no mishaps have occurred with it except that Matons alone has reported a case in which the artery tore a week after the sympathectomy on the external iliac. The patient died from the hemorrhage; the tear was 1 to 1.5 cm. wide. Seifert has observed two cases in which gangrene developed later or a bedsore.

Wenckebach, K. F. ANGINA PECTORIS AND POSSIBILITIES OF SURGICAL RELIEF. [Brit. Med. J., May 10, 1924. J. A. M. A.]

Allbutt's theory of angina is endorsed by Wenckebach and its treatment by resection of the depressor nerve is discussed, although doubt is expressed that it will be the operation of choice because so often the nerve is difficult or even impossible to find. Theoretically, this is the safest form of operation because in it only afferent nerves are removed, and the essential augmentory nerves are left uninjured. There is proof that the depressor nerve, on stretching of the aortic wall by high blood pressure, brings about a rapid fall, thus relieving the stress on the aortic wall.

Nukada, S. NEONEUROGENIC THEORY OF HEART BEAT. [Japan Med. World, April, 1924.]

Experiments with *Limulus* heart have convinced Nukada that the formation and conduction of the heart impulse is a function of the nerve tissues in the hearts of vertebrates, including mammals. In the light of phylogenetic development, one may consider the so-called conduction sys-

tem in mammals as an auricular muscle bundle richly supplied with nervous elements, which has penetrated deeply into the ventricle and which is on that account separated throughout by fibrous tissue from the ventricular muscle.

Scott, J. M. D., and Roberts, F. LOCALIZATION OF VASOMOTOR CENTER. [Jl. of Physiology, Dec., 1923.]

Scott and Roberts have confirmed the existence of a "depressor point" in the area postrema. It coincides with the so-called "cardioinhibitory center." They believe it represents a point where afferent vagal fibers belonging to the depressor occupy a superficial position. There is free decussation of cardioinhibitory fibers between the two depressor points. The rise of pressure obtained sometimes from the fovea inferior is part of a mixed effect which for the present defies analysis. There is not sufficient evidence to localize a "vasoconstrictor center" here. Stimulation of the surface of the medulla gives no evidence of the existence of a vasotonic as distinct from a vasoreflex center, or of the existence of a vasodilator center.

White, P. D., and Viko, L. E. HEART BLOCK. [Am. Jl. of Med. Sc., Vol. CLXVI, May. J. A. M. A.]

White and Viko assert that intraventricular block is almost as frequently seen in a large medical clinic as is auriculoventricular block, 4 per cent of the former class having been found in 3,219 cases observed at the Massachusetts General Hospital, as compared with 4.8 per cent of the latter type. Complete auriculoventricular block showed one-fifth the frequency of unquestionable partial auriculoventricular block. Bundle branch block of high grade made up slightly less than one third of the total number of cases of intraventricular block. Sinoauricular block was rarely found, less than half as often as complete auriculoventricular heart block. Arteriosclerosis was apparently responsible for the majority of cases of complete auriculoventricular block and of intraventricular block of all degrees, but especially, of bundle branch type, where it figured as the chief factor in over 80 per cent. Syphilis was a probable factor in sixteen of 156 cases of auriculoventricular block and in eleven of 130 cases of intraventricular block. In the series of partial auriculoventricular block cases digitalis seemed to be chiefly responsible in more than half, on a background of rheumatic heart disease more often than arteriosclerotic heart disease. Digitalis was also largely responsible for six of the eleven cases of "sinoauricular block." Less than one-quarter of the cases of complete auriculoventricular block showed heart failure, either anginal or congestive, at the time of discovery, and also less than one-quarter gave a history of Stokes-Adams attacks. The mortality from heart failure in the last seven and a half years has been slightly higher in the group with intraventricular block than in the group with auriculoventricular block. Several of the cases with complete heart block were in

fairly good condition some years after the discovery of the block, in fact nine being in "good or in fair health" from one to seven years after the first electrocardiographic evidence of complete heart block. Heart failure was found more often in the patients with intraventricular block than in those with auriculoventricular block, especially heart failure of the anginal type. Angina pectoris was found about four times more often in intraventricular block than in auriculoventricular block. It appears from this study that intraventricular block is of greater significance than auriculoventricular block. For its detection the electrocardiograph is essential.

Moutier, F., and Rachet, J. HEMOCLASTIC CRISIS. [Pro. Med., Sept. 22, 1923.]

Widal's celebrated test works as well with water as it does with milk, according to these authors. It is not a humoral reaction but is conditional by the vegetative nervous system. They were not able to demonstrate an increased vagotonus.

Castana, V. RAYNAUD'S DISEASE IN AN INFANT. [Ped., Dec. 15, 1923.]

Castana publishes a case of asymmetrical vasomotor gangrene of the left upper and lower extremities in an infant, aged seventeen months. The asymmetry of the affection distinguished it from typical Raynaud's disease. The forearm had sloughed off.

Brüning, F. PERIARTERIAL SYMPATHECTOMY IN ARTERIOSCLEROTIC GANGRENE. [Klin. Woch., Vol. II, May 14.]

This paper deals with technical points, and suggestions concerning the operation which he has tried not only in trophic and vasomotor disturbances, but also for beginning gangrene. The spasm of the artery, which persists after the operation for some time, may cause more increase in the gangrene. Yet the clinical picture changes and recovery takes place.

2. ENDOCRINOPATHIES.

Buscaino, V. M. DYSTHYROIDISM, ANAPHYLAXIS AND EPILEPSY. [Schw. Arch. f. Neur. u. Psych., XI, p. 261.]

The author here maintains that: (1) In the thyroids of idiopathic epileptics he finds "anomalous" proteins. He calls these Octaeder-crystals. (2) "Anomalous" proteins are also found in conditions accompanied by epileptiform crises, such as in paresis, arteriosclerotic dementia, idiocy, feeble-mindedness, brain tumor, uremia, alcoholism, cysticercus of brain. (3) The human organism builds specific reaction substances to these protein bodies. (4) Thus the epileptic attack, idiopathic or secondary, is interpreted as a specific anaphylactic reaction. The specific protein comes from the thyroid. (5) An ablation of the thyroid with subsequent thyroid tablet treatment should be effective in genuine epilepsy.

No case material is given. The argument is entirely hypothetical.

Mendel, F. IODIN AND ARSENIC IN TREATMENT OF GOITER. [Deut. med. Woch., Vol. XLVIII, No. 27, p. 896. J. A. M. A.]

Mendel surveys the results of the combined intravenous use of iodine and arsenic in the treatment of more than 100 cases of exophthalmic goiter in ten years. The treatment has always had a prompt effect, having never failed absolutely, while in a large percentage of cases considerable improvement was brought about and in a number of severe cases a permanent cure was accomplished. The technic of this intravenous chemotherapy is exceedingly simple. Every other day, or, after the patient begins to improve, once or twice a week, injections of this solution are given: atoxyl 1 gm., sodium iodid 8 gm., water to make 40 c.c. He gives in detail the case report of a 52-year-old school principal. The patient was much emaciated, weighing only 120 pounds. The expression and appearance of the face were unusually bad, the skin being livid, reddened and moist. There was a moderate but distinct exophthalmos and a medium-sized soft goiter. A marked pulsation of the carotid arteries was noted. The hands were hot and moist and affected by a rapid tremor. The pulse was 140. The patient was in a despairing frame of mind and complained of general weakness, headache, dizziness, restlessness, insomnia, diarrhea and profuse sweating. Injections of the iodine-arsenic solution were begun, for the first two weeks 2 c.c. being given every other day, then the same dose twice a week over a period of four weeks. After the first few injections the patient's spirits improved, the heart action was better and hidrosis became less marked. As the treatment was continued, all the symptoms of exophthalmic goiter abated rapidly; also the diarrhea, without dietary regime. In six weeks the patient gained 20 pounds. The tremor had disappeared entirely. The patient felt so much better he went away for a vacation trip. During his absence, in spite of good and adequate food, he made no further gain in weight. After his return he did not feel so well as he did when he left. Treatment was recommenced with two injections a week, with the result that all the symptoms of exophthalmic goiter were eliminated. After the lapse of five years the patient feels perfectly well and weighs about 164 pounds, a gain of 24 pounds.

Kessel, L., and Hyman, H. T. HYPERTHYROIDISM AND NERVOUS SYSTEM. [Am. Jl. of Med. Sc., Vol. CLXV, pp. 313-314.]

Study of fifty-five persons with thyroid enlargement showed the following: Sympathomimetic manifestations or alterations in basal metabolism were absent in all. Iodids internally administered can reduce neck circumference. The mechanism of the production of hyperplasia is through diminution in the iodine store. Hyperplasia of the thyroid as a result of hypersecretion is based on inferences which are not compatible with the available data. There was no evidence to support the theory of the specific toxicity of adenoma. The influence of nervous impulses on

the secretion of the thyroid gland has not been demonstrated. The rôle of the thyroid in the production of clinical symptoms is much exaggerated.

Harries, D. J. INFLUENCE OF INTESTINAL BACTERIA ON THYROID GLAND. [British Med. J., March, 1923. J. A. M. A.]

This author's inclinations to humoralism led him to the following conclusions: Exophthalmic goiter is due to the excessive absorption of tryptophan from the intestine; this, in turn, is traceable to the absence of the indol producers from the intestine. The absence of indican from the urine indicates the absence of indol producers from the intestine. In exophthalmic goiter the early disappearance of indican from the urine is of a serious prognostic importance. Operative surgery has a definite place in the treatment of exophthalmic goiter. Medically, much can be done by suitable dietetic measures. Diffuse parenchymatous goiter is characterized by an excess of indican in the urine, suggesting an excessive destruction of tryptophan. If this excess gives place to a diminution or complete disappearance of indican, it suggests that the case is assuming the exophthalmic form. Myxedema is due to atrophic changes in the thyroid gland, which loses its capacity for dealing with the circulating tryptophan, whether that substance be excessive, deficient, or normal in amount. The disease is thus compatible with the presence or absence of urinary indican.

McGregor, J. K. EXOPHTHALMIC GOITER. [Can. Med. Assn. J., Dec., 1922.]

The plea is made for a simple classification of goiter—simple goiter—toxic goiter and exophthalmic goiter—being suggested as a subdivision which may standardize the subject in the minds of those who are not specializing in work of this kind. Caution should be used in the preventive treatment of goiter by the use of iodine in any form, without evidence of the absence of hyperthyroid symptoms. The author reviews the symptoms and diagnosis, which are fairly well standardized and places a great deal of reliance on the basal metabolic rate as a differential diagnosis and as an estimate of where the patient stands in the course of the disease. In treatment of exophthalmic goiter, medicine finds no place. Radium and X-ray improve cases clinically but *will not hold them*. Any mild infection will light up an exacerbation. Ligations done in bed in bad cases, with or without preliminary transfusions, reduce the operative mortality. Local anesthesia plus gas-oxygen is the anesthetic of choice. A special point is made in calling attention to injury of the recurrent laryngeal nerve, not on account of the effect on the patient's voice, but as a cause of death from asphyxia, due to adductor paralysis and resulting fixation of the cords in an adducted position. Injury may best be avoided by working from the inside of the gland on a horizontal plane. [Author's abstract.]

Asteriades, T. SUBCAPSULAR THYROIDECTOMY IN EXOPHTHALMIC GOITER. [Bull. Méd., Vol. XXXVII, No. 2.]

Siraud's method of subcapsular thyroidectomy under local anesthesia is here praised as sure, rapid and safe. Fifty-seven "brilliant successes" are claimed with this technic in the same number of cases.

Hunt, R. ACETONITRIL TEST FOR THYROID. [Am. Jl. of Phys., Vol. LXV, No. 2.]

This pharmacodynamic study details the evolution of the acetonitril test as an indicator of thyroid activity. It has served a useful purpose in various ways. There is a definite parallel between the physiologic activity of thyroid and the iodine content. This is true for the thyroids of a number of animals and for thyroids with extreme ranges in iodine content; for the thyroid in exophthalmic goiter; for thyroid iodized in vivo and for fetal thyroids. The physiologic activity of thyroxine, both by feeding and by intravenous injection, is (expressed in terms of iodine content) less than that of thyroid. No evidence of the presence of physiologically inactive iodine in the thyroid was found in normal glands. The blood in certain pathologic conditions, thyroid disease and nephritis, contains unknown, or unidentified, substances which markedly increase the resistance of mice to acetonitril.

Streissler, E. TECHNIQUE FOR THYROIDECTOMY. [Arch. f. Klin. Chir., Dec. 14, 1922, p. 121.]

In this surgical paper the author details in technique. He slits the isthmus in the median line and removes the necessary portions of the thyroid without disturbing the capsule. The parathyroids are not touched and the nourishment of the remaining thyroid is not interfered with.

Giordano, A. S., and Caylor, H. D. LIGATION OF THYROID VESSELS IN EXOPHTHALMIC GOITER. [Surg. Gyn. and Obs., Vol. XXXVI, No. 1.]

An experimental histological research to determine whether consistent involution changes are demonstrable following ligation. If changes are found, whether or not they can be correlated with the clinical course of the case between the date of ligation and the thyroidectomy. Of the fifty cases of ligated hypertrophic parenchymatous thyroid studied in detail, definite involution changes were found in thirty-three (70 per cent), while sufficient distinguishing contrast between the ligated and unligated poles could not be demonstrated in the remaining fifteen. In general, this study shows that distinct clinical improvement and lowering of the basal metabolic rate occurred more often in those cases in which definite involution changes in the ligated pole could be demonstrated histologically. On the other hand, a few definite exceptions demonstrated that a correlation between the clinical findings and the presence or absence of involution changes is not to be expected in all cases.

Mastin, E. V. BLOOD SUPPLY OF THYROID; ITS SURGICAL SIGNIFICANCE. [Surg. Gyn. and Obs., Vol. XXXVI, No. 1. J. A. M. A.]

Mastin shows that the thyroid has a very rich arterial and venous blood supply. There is an extensive anastomosis not only between vessels of the same lobe, but also with those of the opposite lobe. In the event of ligation of all four thyroid vessels, the circulation can be reestablished through extraglandular anastomosis. The secretory activity of the thyroid gland is under nerve control. After ligation of the superior thyroid artery, a polar ligation should be made in order to cut off the veins, lymphatics and remaining nerve filaments. Control of hemorrhage is best accomplished by interrupted mattress sutures placed through the remaining gland tissue, by ligation of all bleeding points, and by the use of gauze packing in the wound if necessary. Bleeding veins can often be demonstrated by having the patient strain or cough before the wound is closed.

Tarnauceanu. GOETSCH TEST AND RADIOTHERAPY IN THYROID DISEASE. [Jl. d. Rad., Vol. VI, No. 11.]

The author advocates the value of this test. He used 1 c.c. instead of 0.5 c.c. of the 1:1,000 epinephrin solution. On account of the uniform findings this test should be adopted to determine the cases suitable for light therapy.

Grafe, E., und von Redwitz, E. THE RÔLE OF THE THYROID IN TEMPERATURE REGULATION AND IN FEVER METABOLISM. [Ztschr. f. physiol. Chem., Vol. CXIX, No. 125.]

The rôle of the thyroid in regulating body temperature is not so important as the work of other investigators might suggest. One experiment, performed on a dog from which the thyroid had been removed, showed that the metabolism during an infective fever did not differ from that of a normal animal under similar conditions.

Holman, E. F. HYPOGLYCEMIA IN EXOPHTHALMIC GOITER. [Johns Hopkins Hosp. Bull., Vol. XXXIV, No. 384. J. A. M. A.]

Holman has found that the marked hyperglycemia occurring immediately after operations on the thyroid corresponds to the period of most active metabolism and the greatest mobilization of the available carbohydrate. This is followed by an abrupt fall in blood sugar content, corresponding to the exhaustion of the supply. In cases reacting favorably, there is, then, a rise in blood sugar, indicating probably a gradual disappearance and elimination of the active thyroid secretion. The rationale of the administration of glucose solutions intravenously is suggested by these studies. A definite plan of intravenous injections of glucose will need to be evolved, controlled by and dependent on successive blood sugar determinations. A weaker solution, from 5 to 10 per cent in strength, administered in quantities of from 300 to 600 c.c. would probably be preferable to the 20 per cent solution. Holman asserts that these findings

also emphasize the importance of a high carbohydrate and high caloric diet in the preoperative treatment of exophthalmic goiter, and of the administration of 5 per cent glucose solution per rectum in postoperative care. The administration of large quantities of fluid by infusion, by mouth, and by rectum, undoubtedly favors the elimination of the active thyroid secretion and is, therefore, also an important factor in reducing the severity of postoperative reaction.

Troell, A. EXOPHTHALMIC GOITER. [Arch. f. klin. Chir., CXXII, No. 3.]

Troell, in a report on sixty-two cases of exophthalmic goiter since 1919, states that the anatomic changes in the thyroid are what determine the special symptoms in the different cases. In particular, the evidence indicates that not merely excessive, but perverted, functioning of the thyroid may be responsible for exophthalmic goiter. The resulting symptoms fall naturally into two groups. Each group is influenced by certain measures and not by others. The more toxic goiters are of the diffuse type; the blood pressure is high, the tolerance for carbohydrates low. [J. A. M. A.]

II. SENSORI-MOTOR NEUROLOGY.

3. SPINAL CORD.

Taylor, J., Greenfield, J. A., and Martin, J. P. SYRINGOMYELIA AND SYRINGOBULBIA. [Brain, December, XLV, Parts 3 and 4.]

Two cases of syringomyelia and syringobulbia are reported by Taylor, Greenfield and Martin. They were unusual because of the long periods during which it was possible to observe them carefully. They also have a special interest because of the striking manner in which the clinical course differed in the two cases. In the first patient the condition underwent no change of consequence during the long period of twenty-four years in which one of the authors had him under almost continuous observation; in the second case, which was under observation for nineteen years, there was, on the contrary, a slow but steady deterioration in physical condition with gradual spread of muscular weakness and sensory change, the result no doubt of corresponding changes in the condition of the spinal cord. The morbid changes in the spinal cords, details of which are given, explain to some extent this difference.

Carp, E. A. SYRINGOBULBIA. [Nederlandsch Tijdschrift v. Geneeskunde, June 10, 1922, Vol. I, No. 23, p. 2239.]

When the process that is responsible for syringomyelia is located in the medulla oblongata, the clinical picture is quite different. Two cases of this syringobulbia are described. The women were thirty-two and

thirty-nine years old, and the disturbances were exclusively or predominantly on the left side.

Wallace, J. W. CRUSH FRACTURES OF SPINE. [Jl. of Bone & Joint Surg., January, 1923, V, No. 1. J. A. M. A.]

Eighty-two cases of fracture of the spinal column are analyzed by Wallace. A great majority of these cases had been unrecognized and consequently untreated. In six cases the method of injury was not given. In nine cases the history of the injury gave no definite forcible flexion of the spine and the mechanism of the fracture could not be determined. In sixty-seven cases a definite history of forcible flexion of the spine was given. In every case in which the history showed that the patient was caught in a flexed position and had his spine flexed so that the head was forced between the legs, a fracture of one of the lower vertebrae was found. In twenty-three cases there were fractures elsewhere in the body. Fracture of the transverse processes was the most common injury. This occurred on either one or both sides and of the vertebra crushed; sometimes the vertebra above and below. Fracture of the spinous processes was rather rare, having occurred in only three cases. Fracture of the articular processes occurred in one case. The data on the complaints of the patients are not complete, but it appears that in half the cases the patients not only had pain in the back, but also had pain referred to other parts, generally the legs, also to the hips, chest, abdomen, head, etc. A few patients had no pain in the back, but had referred pain. A few had no pain whatever.

Foix, Thévenard, et Nicolesco. PAIN OF BULBAR ORIGIN IN SYRINGOMYELIA. SYMPATHETIC SYMPTOMS. PAIN OF CELLULAR ORIGIN. [Rev. neurol., XXIX, 990. Med. Sc.]

The patient was a house painter of fifty and suffered from phthisis. The malady now under discussion developed suddenly three years before death with paroxysms of severe neuralgic pain on the right side of the neck, face, and scalp. The attacks of pain grew in frequency, and in three months became almost continuous. The pain was described as superficial and burning and tearing in quality. It was brought on by exposure to cold, and was accompanied by extreme cutaneous hyperesthesia over the affected area of skin. Later, similar symptoms developed on the left side of the head, but in less intensity. The skin of the right half of the face was flushed and the pinna cyanosed, and the temperature of the skin was above that obtaining elsewhere on the surface. Further, tear, saliva, and sweat secretion was more marked on the right side. There was no definite abnormality in the palpebral fissure or pupil on the right. No other evidence of a lesion of the nervous system was discovered. The patient succumbed to tuberculosis. The brain, cranial nerves, and gasserian ganglia were normal in appearance on the surface.

On section, the only abnormality found was a syringomyelic cavity extending from the lower half of the cervical down through the upper segments of the thoracic cord. On microscopic examination, the cavity was central and had displaced rather than destroyed the grey matter of the cord. The cord and medulla were hyperemic. The nature of the wall of the cavity was that usually seen in syringomyelia. In the lower levels of the medulla on the right side was a fissure in the postero-external region occupying the situation of the substantia gelatinosa Rolandi and presenting the usual features of syringobulbia. The nerve-cells immediately surrounding the fissure showed some chromatolysis. The authors point out that the case is of considerable interest in that it demonstrates the existence of trigeminal pain of bulbar origin, it gives a clear notion as to the characters of pain of central origin, and confirms the view of the cellular origin of pain arising in ganglia, brain-stem, and thalamus. The medullary fissure described occupied the position of the descending root of the fifth nerve. They emphasize that central pain is known to occur in cases of hematomyelia and syringomyelia, and that in this instance certain well marked symptoms were present which are usually attributed to a lesion of the sympathetic. [F. M. R. WALSHE.]

Elsberg, Charles A. THE MECHANICAL EFFECTS OF TUMORS OF THE SPINAL CORD, AND THEIR INFLUENCE UPON SYMPTOMATOLOGY AND DIAGNOSIS. [Am. Neur. Assn., 48th Annual Meeting, May, 1922. Washington, D. C.]

Tumors on the anterior and anterolateral aspects of the spinal cord are relatively frequent and form about one-third of all cases. Although many patients with spinal cord tumors have no pain at the onset, the large majority have some subjective sensory disturbance as an early symptom. In some patients, objective sensory disturbances are absent for a long period and only appear after a lumbar puncture has been performed. Tingling, coldness, burning and other paresthesias are not rare in extramedullary growths. If the tingling occurs in the contralateral limb below the level of the growth, there is considerable probability that the tumor lies on the ventrolateral aspect of the cord. Intradural tumors adherent to the dura and extradural growths not infrequently press the cord to the opposite side of the spinal canal and cause early motor symptoms on the side of the body opposite to that of the tumor. If the signs of motor and sensory disturbances become aggravated after lumbar puncture and withdrawal of fluid, it is probable that the growth is either extradural, or intradural and adherent to the inner surface of the dural membrane. Tenderness of a spinous process at the vertebral level of the lesion points to bone disease; tenderness of spines well below the vertebral level of the growth points to an intradural extramedullary tumor. [Author's abstract.]

Sgalitzer, M., and Jabron, S. SPINAL CORD TUMORS. [Mit. a. d. Grenz. d. Med. u. Chir., XXXV, No. 5.]

Fifteen cases are summarized in which the tumor had grown from the spinal cord or its membranes. In three of the ten extramedullary tumors there were small exostoses on the nearest vertebræ, while the spine seemed otherwise intact. The neurologic, röntgen and operative findings are compared with the course, and with the necropsy findings later in five cases.

Wirth. THE ACTUAL CAUTERY IN THE TREATMENT OF PARALYSIS FROM VERTEBRAL DISEASE. [Klinische Wochenschrift, April 8, 1922.]

Experience of the use of the actual cautery in paralysis from vertebral disease is here discussed. He supports the view of Quinke as to its value, and thinks it may be of service, especially in spastic paraplegia following tuberculous disease of the spine. He records three successful cases. Examination of the first case revealed disease of the fourth and fifth dorsal vertebræ; diminished sensation from the fifth dorsal segment downwards; spastic condition of the legs; Babinski reflexes; ankle-clonus. After open-air treatment for tuberculosis the bone symptoms disappeared, but the spastic paralysis increased, so that the patient could not stand. The spine was cauterized. Prompt improvement occurred and he was soon able to walk. Two months later the spasm of the legs had disappeared, and there was no ankle-clonus, no Babinski reflex, and no sensory disturbance. In the second case there was disease of the twelfth dorsal and first lumbar vertebræ. The chief symptoms were pains in the thighs, formication in the feet, ataxic gait and ataxia of the left leg. The spine was cauterized. The ataxia, pains, and paresthesia disappeared rapidly. In the third case (myelitis of the lumbar region and conus—chiefly in the anterior grey matter) the chief symptoms were priapism, marked atrophy of the left leg and slight of the right. After cauterization of the spine the priapism soon disappeared, the movements of the left leg improved, and the atrophy was less marked. The cautery is applied on each side of a vertebral spine during slight ether narcosis.

Moersch, F. P. ACTINOMYCOSIS OF THE CENTRAL NERVOUS SYSTEM. [Am. Arch. Neurol. & Psych., VII, 745. Med. Sc.]

Actinomycotic involvement of the central nervous system is not rare. The process is usually secondary to some other focus in the body and apparently the meningeal type, in which the infection takes place by contiguity, is most frequent. The course of the disease is chronic with markedly insidious onset, meningeal involvement occurring without any clinical sign. The examination of the spinal fluid usually shows a pleocytosis before any clinical symptom of meningitis. A positive result on spinal fluid examination with only slight signs of meningitis is almost pathognomonic. During the terminal stage the diagnosis is certain, but in the early stages a positive diagnosis on clinical symptoms alone is

practically impossible. The presence of a chronic phlegmon of the head or neck indicates the possibility of actinomycosis, and an examination of the spinal fluid and a search for sulphur granules should be made. [C. da Fano.]

Micotti, R. CHORDOMA OF THE SACRUM. [Policlinico, May 15, Vol. XXIX, p. 265.]

A man of fifty-three died a few days after removal of a malignant chordoma. About three months before the symptoms first appeared, following a trauma of the region, a tumor developed and rapidly increased in size. Exploratory puncture in his case differentiated the lesion before the operation. The growth recurred *in situ* after an interval of four months and thirteen months in two of the cases, but metastasis was never known. (?)

4. MIDBRAIN, CEREBELLUM.

Ingvar, Sven. ON CEREBELLAR LOCALIZATION. [Brain, October, 1923.]

The author's own conclusions are: The basal portions of the cerebellum, situated immediately above the fourth ventricle, are phylogenetically the oldest parts of the cerebellar cortex. Special attention must in future studies be paid to these parts, which have hitherto been neglected. Anatomical facts indicate that they are endowed with important functions. The most characteristic feature of these basal regions is that they receive fibers directly from the vestibular nerves, according to studies previously made by the author. The histological uniformity of the cerebellar cortex, even in the human cerebellum, indicates that function and organization of function are probably essentially the same in the whole organ. All evidence on the function of the basal regions will therefore be of the greatest value for an understanding of that of the whole cerebellum. After lesions of the basal parts motor phenomena known as "forced movements" occur.

It has been shown by Russell, Ingvar, and Simonelli that these forced movements after lesions of the posterior lobe appear chiefly as a falling backwards. These same authors have demonstrated that the more posteriorly the lesion lies, the more pronounced is this falling backwards during the acute stage.

Since the forced movements resemble strongly those appearing after lesions of the vestibular apparatus, it is logical to regard the forced movements after cerebellar lesions as being due to disturbance of the vestibular innervation of these parts.

Both the vestibular and cerebellar forced movements always take place in a definite plane of space. When such lesions involve the anterior or posterior parts of the basal region the forced movements take place in a sagittal plane around a frontal axis, while lesions of the

lateral parts of the cerebellum give rise to forced movements in the frontal plane around a longitudinal axis.

Since those associated with lesions of the anterior and posterior parts of the vermis resemble those produced by lesions of the vertical semi-circular canal, it is logical to conclude that this canal is specially connected with these regions of the cerebellum. Certain clinical observations speak in favor of this hypothesis.

The fact that forced movements disappear soon after the infliction of the lesion is not an argument that they are not of cerebellar origin, or without importance for our knowledge of cerebellar physiology.

As the basal regions of the cerebellar cortex with their intimate vestibular connections are, in the literal sense of the word, a sort of calyx which encloses the major part of the cerebellum, which is developed later in phylogenesis, so the functions of the labyrinth may be considered to include in embryo those of the cerebellum. There is during phylogenetic development a tendency of regression of the vestibular influence on cerebellum, whereas the spinal influence increases (strongly developed spino-cerebellar tracts in higher animals). Morphological and histological studies have provided ample evidence that the cerebellum is an identical organ in all vertebrates. There exists a complete homology between all parts of all cerebellums, except in the case of the bony fishes. Accordingly, in all the same system of functional localization must hold. A long series of experiments on the cerebellum has shown that in animals the limbs are at least to a considerable extent represented in special regions of the cerebellar cortex (lobulus ansoparamedianus, Bolk), and that the center of the fore limb is situated rostrally to that of the hind limb. Two cases are described in this article which strongly support the view that in the human cerebellum there is the same arrangement of the centers of homologous parts. In the first case, where a tumor lay in the right lobulus biventer, the only clinical symptom was cerebellar ataxia of the right leg. In the second case the right hemisphere was injured extensively by an operation, and post mortem examination showed that a large part of the hemisphere (semilunar lobes, lobulus gracilis, part of lobus biventer had been completely destroyed. The severe general ataxia that followed the operation disappeared gradually from all parts of the body except in the right arm, though a slight disturbance of a cerebellar type was also noticed in the right leg.

Another review by F. M. R. Walshe in *Medical Science* says: The present paper is largely a summary and an amplification of a large monograph published by Ingvar in 1918 ("Zur Phylo und Ontogenese des Kleinhirns nebst einem Versuch zu einheitlicher Erklärung der zerebellaren Funktion und Lokalisation"). Ingvar cites three fundamental facts in our knowledge of the cerebellum. The cerebellar cortex is uniform in structure throughout the organ and throughout the animal series.

The cerebellum is built up in the same manner and develops in the same part of the neuraxis in all animals. From these facts, it may be inferred that the cerebellar cortex has a uniform function in all its parts and in all animals, a conclusion which does not exclude a topographical representation of the body within the cortex. Contrary to Bolk's teaching, Ingvar has proposed a subdivision of the cerebellum into anterior, posterior, and middle lobes, the two latter corresponding to Bolk's lobus posterior. The middle lobe includes Bolk's lobuli ansiformis and para medianus, which form the bulk of the cerebellar hemispheres. Ingvar points out that differentiation of a given structure in the nervous system takes place at the center, the marginal areas remaining undeveloped and relatively undifferentiated. In illustration he quotes the phylogenetic development of the cerebral hemispheres and of the olives. The same principle holds good for the cerebellum, the marginal areas being the oldest phylogenetically and the least developed and differentiated. Morphologically, the marginal areas, the paleocerebellum, are the anterior and posterior lobes. To the cortex of these pass the great bulk of the spino- and vestibulocerebellar fibers. The most recently and most highly developed portion of the cerebellum, the neocerebellum, is the middle lobe. This makes its first appearance in mammals, contemporaneously with the pons and pyramidal system of fibers, and to it pass the pontocerebellar fibers. It forms the main bulk of the cerebellar hemispheres in man. Ingvar does not accept Edinger's view that the vermis and flocculi represent the palaeocerebellum.

Passing to the question of cerebellar localization, he briefly reviews such evidence as there is for the conclusion that the musculature of the forelimb is predominantly represented in the anterior part of the ansiform lobe (*crus primum*) and that of the hind limb in the posterior part and in the paramedian lobule. In respect of the anterior and posterior lobes, he remarks that vestibular fibers pass to the cortex in these regions and suggests that representation may be based upon a spatial plan—that is, localization of the planes of space separately. In support of this notion he quotes the observations of earlier workers and also his own researches as showing that destructive lesions of the anterior lobe produce a tendency to fall forward, those of the posterior lobe a tendency to fall backward. Simonelli, however, as Ingvar points out, does not regard these symptoms as true defect manifestations, but as transient "irritative" or "dynamic" symptoms. Ingvar ridicules the suggestion, but it may be pointed out that the work of Magnus and de Kleijn, of which he appears to fail to appreciate the great importance, is in accord with Simonelli's conclusions and has shown the nature and importance of initial functional disorders of the kind.

In generalizing as to cerebellar function, Ingvar tends to adopt the vague phraseology so favored by writers on the subject, stating that the

cerebellum is "a reflex organ which preserves the static and dynamic equilibrium of the organism," and therefore is responsible for the regulation of muscle tone. He believes that all the components of the cerebellar symptom complex are simply particular manifestations of loss of muscle tone, a view which he claims to have been the first to enunciate. However, he does not appear to have taken into account recent physiological work on the nature, maintenance and regulation of muscle tone, or that dealing with the postural activities of the labyrinth. Hence his definition of cerebellar function and his interpretation of the cerebellar symptom complex remain devoid of precision and are of uncertain meaning. Two case records are given, providing evidence of a topographical localization in the cerebellar cortex. The paper also contains a discussion of Barany's views as to cerebellar localization. It should be consulted in the original by those interested, particularly in respect of that part of the paper dealing with cerebellar development and morphological subdivision.

Eckstein, G. METHOD OF APPROACHING CEREBELLUM. [Jl. Lab. and Clin. Med., April, 1924.]

This author works his way inward to the cerebellum directly from the edges of the foramen magnum. Trephining is superfluous. The operation secures at once the calamus scriptorius and the cerebellum at its lower edge.

De Vries, Ernst. CONGENITAL CEREBELLAR ATAXY WITH WEAK MINDEDNESS. [Nederlandsch Tijdschrift voor Geneeskunde, August 25, LXVII, p. 849.]

De Vries has shown to the South Holland Neurologists' Society two cases of congenital cerebellar ataxy with weak mindedness (the so-called imbecilitas cerebello atactica). A youth showed first ataxy, with bilateral Babinski reflex; then choreiform shocks appeared and became steadily worse during the last six years; in this case, in addition to the congenital cerebellar ataxy and the spastic spinal paralysis there must be degeneration of a third system, either of the corpus striatum—as in Huntington's chorea—or of the subthalamic paths. The second case was an idiot girl of thirteen who is very spastic and ataxic. She can speak a number of words, though slowly and with much associated movement. Her grasp at held up objects is that of a double athetosis. She cannot voluntarily move her legs. When supported, with feet in contact with the ground, immediately there follows a rhythmical stamping that lasts sometimes a long time. This is seen also often when her legs hang free. It is very rapid, much quicker than the measured beat of the spinal cord dog. In the horizontal position of the legs it does not occur. Since all voluntary movement of the legs is wanting there must exist here an automatism that reminds one of the spinal cord animals. She retains

pain sensibility in the legs. There is a Babinski plantar response. [Leonard J. Kidd, London, England.]

Escomel, E. MALARIA AND CEREBELLUM. [Am. Med., IV, 1-172.]

Clinical history of severe malarial infection with localization of the parasites in the cerebellum. The man was comatose in addition to the multiple and pronounced cerebellar symptoms, also inconstitence of urine. All subsided under quinin.

Rümke, H. C. A LESION IN THE DORSAL PART OF THE PONS AND MID-BRAIN. [Nederlandsch Tijdschrift voor Geneeskunde, LXVIII, p. 724.]

Rümke reports to the Amsterdam Neurologists' Society a case of a lesion in the dorsal part of the pons and mid-brain in a patient of thirty-five. In the course of about eight weeks the following symptoms developed: uncertainty in the use of the right hand, difficulty in piano playing, loss of sensibility in the right hand and leg, diplopia, tinnitus in left ear, and tendency to fall to right and to left. In July, 1922, there was an anesthetic and analgesic patch under the right eye. Over the whole right half of the body from the neck there was a slight disturbance of all sensory qualities which increased towards the distal parts. Left corneal reflex the weaker; left abducens paresis. Ataxia, dysmetria, and adiado-kokinesia of the right arm; tends to fall to right; right Babinski sign. Soon a right facial palsy of peripheral type developed. A provisional diagnosis of an affection of the left tegmentum was made; the nature of the lesion was uncertain; a tubercle, a neoplasm, a thrombosis, and an atypical sclerosis multiplex were considered. The lesion now began to involve a deeper part of the pons; the left masseter and temporal muscles were paretic and atropic; there was deafness in left ear and nystagmus on looking up; there were slight phonation symptoms, the velum on left acting badly then; tongue comes out to right, and appears somewhat flattened. The pyramidal signs on the right side increased; the right abdominal reflex was lost. In the spinal fluid there was a positive Nonne reaction, with definite xanthochromia, the pressure not being increased. Two months later the masseter and the temporal acted almost normally, and the facial palsy became a paresis. The tenth and twelfth cranial nerves were normal. The sensory signs were much less definite. But the stereognosis remained unchanged, and also the adiado-kokinesia and asynergia of the right arm. It was remarkable that figures written on the skin were fairly well recognized. But with this improvement there was also a change for the worse. Thus, the lesion is now extending upwards into the region of the corpora quadrigemina, the left pupil becoming narrower, and the light reaction becoming almost abolished; there was a definite nystagmus on upward movement with associated movement of the upper eyelids. This nystagmus was also sometimes present during rest.

In addition there was a peculiar eye-phenomenon; up to now the abducens palsy had shown the normal type. Now, however, whenever the eyes moved to right or to left, a converging movement of both eyes appeared as soon as the left eyeball had reached the position of rest. Rümke regards this as a sign indicative of a quadrigeminal region lesion; in favor of this there is the almost fixed pupil to light and the vertical nystagmus. And now this upward extension of the lesion began to disappear. After January, 1923 (about six months or so after the onset), the condition became well nigh stationary: slight left abducens paresis, slight nystagmus on looking to right, ataxia, dysmetria, and dysdiadochokinesia on right. It was noteworthy at this time that while deep sensibility, pressure-sensibility, recognition of figures written on the skin, touch, pain, and temperature sensibility were, sometimes entirely unaffected, the stereognosis was still present in the same marked degree. From this we may conclude that here the stereognosis occurred as a genuine primary disturbance and as a sign of a mid-brain lesion. But we are still in the dark as to the nature of the lesion. The case confirms the opinion of Wallenberg that in a focus which does not extend into the region of the dorsal columns or the dorsal column nuclei the capacity of recognition of figures written on the skin is preserved. [Leonard J. Kidd, London, England.]

Magni, L. BULBOPROTUBERANTIAL TYPE OF POLIOMYELITIS. [Riv. Clin. Ped., February, 1925.]

Two cases of poliomyelitis are here reported in which the chief involvements were of the medulla.

Austregesilo, A., and Gallotti, O. A CASE OF HEMICHOREA AND HEMIPARESIS DUE TO LESION OF THE CAUDATE NUCLEUS. [Revue Neurologique, An. 31, T. 1, No. 1, p. 41.]

There was weakness on the left side, including the face and choreic movements on the right side. An area of softening was found in the head of the right caudate nucleus. [Camp, Ann Arbor.]

Brouwer, B. HYPOPLASIA PONTO-NEOCEREBELLARIS. [Psychiat. en Neurol. Bladen, No. 5*, Sept.-Oct., 1924, p. 461, 6 figs.]

The central nervous system of this case of pontocerebellar atrophy came from a mentally deficient child who died from bronchial pneumonia at the age of twenty-one months. The cerebral hemispheres were well developed, and the frontal lobes were of normal size. The vermis was much better developed than the cerebellar hemispheres; more especially in the anterior part (Bolk's lobus anterior) the separation between vermis and hemispheres is sharper than in a normal case; in the hemispheres there is much microgyria. On the ventral side the hypoplasia is more particularly localized in the lateral parts; the flocculi are normal. The pons is much too small. The microscopical examination shows that there

is a great difference between the condition of the paleocerebellum and the neocerebellum. In the hemispheres many of the lobi are wanting and in various places the cortex is badly developed. The whole cerebellum is smaller than normal, but the hemispheres have suffered most. The changes are very great in the anterior and the simplex lobes; the boundary between the abnormal part of the lobus anterior and the normal vermis is clearly marked. In the remaining parts of the neocerebellum, while certain lobi show well stained cells, many of the lobi and sublobuli are not differentiated and their myelinization is insufficient. The pathological process is somewhat less pronounced in the area of the amygdala and the immediately neighboring parts. While the nuclei tecti globosi and emboliformes do not show any clear abnormality, the nuclei dentati are quite abnormal, being arrested in their development. The dorsal part of the dentate nucleus, which is the oldest part and is connected with the paleocerebellum, is alone better formed. The pathological process is symmetrically pronounced on both sides of the cerebellum. The oblongata is small, but otherwise well developed. The fibers of the pons are poorly developed. The lower olives do not show severe changes; the medioventral and the dorsal accessory olives are normal. Though in some parts of the lower olives (proper) the cells are not wholly developed, yet the greater part of these principal olives are normal. The fibers of the olivocerebellar tract are pretty well stained in the Weigert-Pal sections. Also the hilus of the inferior olives is richly provided with fibers, and the intraolivary system may be seen. The pons is very small and poorly myelinated. In the frontal third the pyramidal tracts and the fronto-pontile and temporo-pontile tracts are clearly stained. But the transverse fibers of the pons are scarcely visible; the typical layers of the stratum superficiale, complexum, and profundum we miss. The arrest of development is still greater in the caudal third; as a consequence of this the middle cerebellar peduncle is reduced to a thin band of fine fibers; also the nuclei arciformes, which, as Jelgersma showed, are nothing but the most caudal part of the pons, are badly developed. The red nucleus is present, but is too small; the number of fibers and cells in it is reduced. In this case the differentiation of the various lobi and sublobi and their development is manifestly hindered only in the neocerebellum, and the myelinization has suffered almost exclusively in it. We see this also in the case of the cerebellar nuclei; the older ones are normal, but the greater part of the dentate nucleus, which is connected with the neocerebellar cortex, is arrested in its development. The cause of this misformation must have reacted on the nervous system in a period of intrauterine life when the neocerebellum was still differentiating. In this case Brouwer cannot help seeing the principle of system degeneration; the cause which arrested the development of the cerebellar system reacted much more intensely on the pontocerebellar system than on the olivocerebellar system. [Leonard J. Kidd, London.]

Winkelman, N. W., and Eckel, J. L. HISTOPATHOLOGIC FINDINGS IN CASE OF FRIEDREICH'S ATAXIA. [Am. Arch. Neur. & Psych., XI, No. 1.]

These authors give a detailed account of the pathological findings in an old hospitalized case of Friedreich's ataxia which had for thirty-four years shown a classical picture and had also developed atrophy of the distal muscles of the extremities. A very small cerebellum and cord were found at the postmortem. The cerebellum showed a progressing degenerative process. A secondary tract degeneration, especially in the posterolateral regions was present in the cord. The cortex, cerebellum, and spinal cord ganglion cells were in various stages of atrophy. The authors in their discussion state that neither clinically nor pathologically is this case in keeping with Marie's dicta, and the posterior part of the cord is little, if at all, affected in those cases with small cerebellum.

III. SYMBOLIC NEUROLOGY

3. PSYCHOSES.

Sawyer, C. W. LABORATORY FINDINGS IN DEMENTIA PRECOX. [Ohio St. Med. J., Aug. 1923. J. A. M. A.]

The blood in 107 cases of dementia precox was analyzed by Sawyer. The red cell count was below normal in 43.3 per cent; above normal in 34.9 per cent; normal in 21.6 per cent. The white cells were below normal in 29 per cent, above normal in 51.5 per cent, normal in 19 per cent. The hemoglobin range was from 50 to 105 per cent. Eighty-one per cent of the cases were below normal; 19 per cent normal; 50 per cent showed less than 70 per cent of hemoglobin. The systolic blood pressure ranged from 80 to 190 mm. Sixty-nine per cent of the cases were below normal; 17 per cent above normal and 12.5 per cent were normal. A positive Wassermann reaction was present in 31 per cent. The gonorrheal complement fixation test gave a positive result in 41 per cent; the tubercular complement fixation in 30 per cent. Eighty-three per cent of the cases showed indican and 66 per cent diacetic acid in the urine. This suggests an autotoxic basis for the disorder or an autotoxic complication of significance. It also suggests a line of treatment.

Comby, J. PSYCHOSES IN MOROCCO. [Bull. Méd., Aug. 18, 1923. J. A. M. A.]

Comby relates that the nonviolent psychotic in Morocco are not segregated. The violent mentally ill are housed in the historic, antique shelters that were built for pilgrims. The small rooms open only on a central court, and are without door or window or furniture of any kind. A long chain is fastened to an iron band around the neck. The other end of the chain passes through a ring in the ceiling and a hole in the

wall and is fastened outside. The men are housed on the first and the women on the second floor of these maristans which can shelter from twelve to fifty, though they have comparatively few inmates. Delirium tremens is very rare, and paresis is even less frequent among the natives; hashish or cannabis indica poisoning is the chief cause for the psychosis. Comby says that the inmates are not maltreated, but neither are they treated. There is no medical supervision of these medieval jails, and the *cadi* orders or suspends the internment in accordance with the testimony of neighbors or friends. The French protectorate, for political and religious reasons, has not interfered with these sacred historical institutions, but Comby says that the psychotic should be transferred to places where they can be given proper treatment.

Kinnier Wilson, S. A., RÔLE OF TRAUMA IN THE ETIOLOGY OF ORGANIC AND FUNCTIONAL NERVOUS DISEASE. [Journal A. M. A., Dec. 29, Vol. LXXXIV.]

The assertion that trauma may originate cerebral tumors, is unjustified and obsolete. This is also true of disseminated sclerosis. Various cases of neurosyphilis, including tabes and general paralysis are on record, in which an apparent connection between trauma and the appearance of symptoms of general paralysis, for example, is sufficiently impressive. In the absence of spirochetal infection no one will now admit that trauma, per se, can cause neurosyphilis in any of its manifestations. Can it actually initiate a morbid process on the part of the spirochete, in the sense that the latter otherwise would have remained forever latent and innocuous? Put thus, the question can scarcely be answered in the affirmative; yet who shall say that a direct negative represents the only possibility? Since there must be some limit to the interval of time elapsing, after an alleged injury, ere symptoms appear, Wilson suggests that in the case of organic nervous disease it should be restricted at the widest to one week. The author's general standpoint is that he is unable to understand how a single trauma can cause a progressive neural degeneration of abiotrophy; still less a progressive neural toxidegeneration. He is convinced that the solution should be sought in the biochemical field of intrinsic neural "life and death," and not glibly assign progressive degenerative processes to the action of a "shock"; even assuming a concussion so bad as to produce, on a small scale, fragmentation of myelin, we know, as a histologic fact, that scavenging takes place very promptly and that neural regeneration is equally sure. This being so, the view that trauma may on occasion cause neural abiotrophy of a progressive character is opposed to the facts of neuropathology. As for epilepsy, Wilson believes with Turner when he insists that "it is difficult to avoid the conclusion that something more than local tissue alterations are requisite for the production of the seizures of traumatic epilepsy, and the determining agent, in my opinion, is an inherited or inborn con-

stitutional predisposition to nervous instability and epilepsy." The war has shown a thousand times how the genuine effects of concussion, cranial or spinal, pass off eventually, with a complete return to the normal; but if they persist, in the absence of evidence of objective change, it may be taken as an infallible rule that the condition has ceased to be one of concussion. Conscious and unconscious motives also must be taken into account.

Strauch, August. MONGOLIAN IDIOCY IN BOTH TWINS. [Journal A. M. A., Dec. 29, Vol. LXXXIV.]

This author records two cases of mongolian idiocy in twins, the first born of young, healthy parents. The occurrence of a mongolian idiot with a normal twin has been observed only in double ovum twins, as far as known. Mongolism in both twins has been described only in twins of the same sex. They are probably single ovum twins. Strauch believes that the conception of mongolism being due to an endogenic factor seems to find support in these observations.

Kopeloff, N. and Kirby, G. H. FOCAL INFECTION AND MENTAL DISEASE. [Am. J. Psych., Vol. 3, Oct. J. A. M. A.]

In a series of 120 cases showing manic-depressive, dementia precox, psychoneurotic, and psychopathic personality reactions, the removal of focal infection in fifty-eight cases did not result in a higher percentage of improvement or recoveries than in a comparable group of sixty-two cases in which foci of infection were not removed. Reviewing the entire group of operated cases showing recovery or improvement, and comparing the original prognoses with the subsequent course, the observations made by Kopeloff and Kirby demonstrate that in every case that recovered, a recovery had been forecast before treatment was started; and that no case recovered in which a poor prognosis had been given. Furthermore, in only one case did an unexpected improvement occur. A critical study of the methods used by Cotton for establishing focal infection has proved them to be unsatisfactory for teeth, stomach, lower intestine and cervix. The authors believe it is desirable to eliminate focal infection when adequately demonstrated in psychotic patients in the same way as one should attempt to alleviate any physical disorder. Nevertheless, it has not been shown that focal infection is the etiologic factor in the functional psychoses.

Schrijver-Hertzberger, S. HEREDITY IN PSYCHOSES. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXXVI.]

The writer gives some of the results from an investigation undertaken upon 3200 patients. She finds that psychoses among brothers and sisters are more frequent in families where both parents show psychotic disturbances than in families where both parents are healthy. The disturbances which are shared by parents and children alike are imbecility,

character anomalies, manic-depressive insanity and dementia precox. Some cases of imbecility and of character anomalies seem to stand in one hereditary relation to dementia precox. The most frequent disturbances found in one parent and one or more of the children were dementia precox, often imbecility, manic-depressive insanity and character anomalies. Imbecile mothers usually had imbecile or schizophrenic children. Where there was schizophrenia in the children there was usually alcoholism or imbecility of one parent or character anomalies of both parents, while it was relatively frequent that schizophrenia and manic-depressive insanity occurred in brothers and sisters of drinkers. The manic-depressive psychoses showed a relation to nervousness and character anomalies. Half of the epileptic children had drunken fathers.

Duarte Salcedo. AMAUROTIC FAMILY IDIOCY. [Med. Ibero, Jan. 3, 1924.]

Duarte Salcedo gives an illustrated description of four cases of Tay-Sachs' disease. He says that it is comparatively frequent in Spain in communities where there is much intermarrying of a few families. The parents in two of his four cases were closely related; none were Jews. Inherited syphilis is another frequent factor. The primary cause, he says, is defective development of the brain. The ocular manifestations are secondary and are variable and not pathognomonic.

Mauz, Fr. SCHIZOPHRENIA WITH PYCNIC BODY FORMATION. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXXVI.]

Special observation was made directed to all the schizophrenics with pycnic body formation admitted to the Tübingen clinic within the last two years. Seven cases were found with a circular course, and symptomatic attacks suggestive of circular psychosis. There were also 2 cases of the type of paraphrenia phantastica in which the personality was intact. These too were suggestive of manic-depressive psychosis. The heredity in the cases observed frequently was mixed one, schizophrenic and circular.

Farani, A. and Fajardo da Silveira. INFECTIOUS PSYCHOSIS. [Arch. Brasil de Med., Dec. 1923.]

The man had been in bed for some days with supposed severe sciatica; the leg was drawn up on the pelvis, and the pain spread down the back of the thigh. He did not reply clearly to questions and the mental confusion seemed to be more pronounced at night, amounting to actual delirium. The "sciatica" was of about a month's standing, and the physician's examination explained it as a suppurating phlegmon in the right iliac-lumbar fossa with pyemia. Two colored plates show the wide extension of the phlegmon and the means by which it was cleared out. An injection of physiologic solution with epinephrin hastened the subsidence of the psychosis.

Gibbs, C. E. SEX DEVELOPMENT AND BEHAVIOR IN FEMALE PATIENTS WITH DEMENTIA PRAECOX. [Am. Arch. Neur. & Psych., Vol. II, Feb.]

Many patients with dementia precox present a variety of symptoms that are definitely sexual in nature, and various theories have been advanced to explain dementia precox as essentially a sex disorder, either mental or physical. The observations presented by Gibbs are part of a study of the sex factor from the standpoints of biologic psychology and physiology. The three most definite factors considered have been instinct, emotion and the reproductive function in a physiologic sense.

Minkowski, F. and E. INHERITANCE OF MENTAL DISEASES. [Schweiz, Arch. f. Neur. u. Psych., Vol. XII, No. 1.]

The authors present in a very thorough and well arranged study the results of investigations carried on for years in two families which afforded abundant material. They open up questions of great importance and of great promise for further study both as regards matters directly pertaining to clinical psychiatry and concerning general biological and social problems. They have made a distinct contribution to the study of heredity.

Bakody, v. THE EFFECT OF COCAIN UPON THE VEGETATIVE NERVOUS SYSTEM IN SCHIZOPHRENIA. [Ztschr. f. Nervhik., Vol. LXXVII, Nos. 1-6.]

Bakody reports as a frequent result of administration of 2 cg. of cocaine in schizophrenics lowering of blood pressure, slowing of pulse, increase of Aschner's reflex and perhaps slowing of respiration.

Hyde, George E. RECOGNITION OF PRE-PSYCHOTIC CHILDREN BY GROUP MENTAL TESTS. [American Journal of Psychiatry, Vol. II, No. 1.]

This is a report of work done at the Utah State Mental Hospital where there are 100 feeble-minded patients. The author's criteria of gross mental disturbances in later life are the short attention span and long reactive periods which he thinks may be recognized in group tests of morons to the end of determining the socially amenable cases early. [Menninger.]

Lewis, N. D. C. ANATOMIC CONSTRUCTION IN DEMENTIA PRAECOX. [South. Med. J., May 1923, J. A. M. A.]

One group of 601 cases of dementia precox coming to necropsy was examined by Lewis as to the anatomic construction, and another smaller group composed of twenty-two unselected cases, representing all cases of this disorder examined postmortem during eight months, was also examined from this standpoint, and in addition the major endocrine glands were studied in detail. It was apparent that one of the chief differences from the anatomic viewpoint between this group and other

mental disorders was in the circulatory and lymphatic systems, and evidence was obtained strongly indicating that this difference was a fundamental one: that is, that it was a part of the organization at birth, not acquired unless very early in life and not the product of, or influenced profoundly by, prolonged visceral disease. The average weight of the dementia precox heart is one-third less than the normal or average, the small size being independent of race, age, sex, size of body, duration of psychosis, or lethal lesion. It stands out in considerable contrast with the other mental disease groups. Pronounced alterations in the supra-renal cortex were as constant a feature as regressive atrophy of the testes. In 50 per cent of the cases there was a definite arrest in the cortical development. Accessory suprarenals were frequently found in the dementia precox group. The thyroid gland has been found altered in its connective tissue and colloid structures in such a manner as to suggest a functional association with the genital glands.

Schuster, J. BIOLOGY OF SCHIZOPHRENIA. [Ztschd, f. Nervhkl., Vol. LXXVII, Nos. 1-6.]

Various types of degeneration of the organs of internal secretion were revealed by means of Abderhalden's method.

Frets, G. P. and Overbosch, J. F. FAMILIAL AMAUROTIC IDIOCY. [Ned. Tijd. v. Gen., Sept. 15, 1923.]

This condition developed in a nonjewish family. Three brothers were involved at the age of three, and the disease proved fatal in 3 years. The family was not Jewish, and the child born before and the two born since seem to be normal. The microscopic findings class the cases as of the Spielmeier-Vogt type.

Schmitz, H. MONOSYMPOMATIC MELANCHOLIA. [Münch. med. Wschr., Vol. 70, No. 13.]

Schmitz mentions various cases of melancholia in which almost the only manifestation of the depression was in the form of organic distress, the strong affective character of which, together with absence of organic disease, led to the diagnosis. He cites a woman 31 years of age who complained of severe disturbance in the stomach, a pastor 36 years of age who suffered from sexual excitement with constant fear of pollution. A third patient could not free himself from the thought of tuberculosis of the bronchi suggested by a physician.

Bormann, E. TRAINING OF THE FEEBLEMINDED. [Med. Klinik, Sept. 16, Vol. 19.]

Perception, concentration and practical sense in defective children are here studied. The first two qualities determine the possibility of school instruction, while the last is the important factor in the future usefulness of the feeble-minded. He found his opinion confirmed by the development of forty-nine children.

Glaus, A. and Zutt, J. PRECIPITATION OF RED BLOOD CORPUSCLES IN SCHIZOPHRENIA. [*Zschr. f. d. ges. Neur. u. Psych.*, Vol. LXXXII.]

The authors have made extensive investigations upon the principle that "rapidity formulae" plainly characteristic of definite conditions can be obtained by the exchange between a patient and a test case of the blood plasma and the red corpuscles which have been allowed to settle. The authors found that a rather great rapidity of precipitation and a characteristic rapidity formula appeared in the more organic and catatonic cases of schizophrenia as over against the more functional cases. The character of the disease must always be taken into account in schizophrenia if the question is to be solved whether schizophrenia presents a nosological unity or not.

Wuth, O. MORPHINISM. [*Münch. med. Woch.*, Oct. 12, Vol. 70. J. A. M. A.]

Wuth points to the resemblance between the symptoms of morphinism and of hypofunction of the thyroid; also to the resemblance between the violent disturbances from sudden abstention and the symptoms from hyperthyroidism. Generally speaking, the parasympathetic tonus seems to be increased during addiction and the sympathetic in abstention. He reviews the experiments of other authors which speak for the supposition that morphin acts on the thyroid gland—perhaps through the central nervous system.

Wolfensberger, M. ACUTE HALLUCINOSIS AND SCHIZOPHRENICS. [*Zschr. f. d. ges. Neur. u. Psych.*, Vol. LXXXII.]

Wolfensberger reports 10 of the 16 cases which he describes as developing pronounced schizophrenia after alcoholic psychosis. A psychopathic condition with schizophrenic paranoid symptoms developed later in 2 male patients, a third showed similar development and in a fourth there was at least a suspicion of schizophrenic elements. One patient showed debility with a paranoiform disposition which may have been purely catathymic. Only one of those described showed no further psychopathic symptoms after recovery from the alcoholic attack but this patient from the beginning did not manifest a purely alcoholic psychosis. Therefore the writer concludes that in by far the greater number of cases alcoholic insanity must be considered only as a symptomatic picture representing the reaction of a schizophrenic brain to a definite form of alcoholic poisoning. It remains still to be proved whether psychosis can develop in the nonschizophrenic.

Richardson, W. W. NUTRITION IN ETIOLOGY, COURSE AND PREVENTION OF MENTAL DISORDERS. [*Atl. Med. J.*, Nov. 1923, J. A. M. A.]

A purely hypothetical study made by Richardson of a group of presumably curable mental cases, 75 per cent gave a history of recent loss of weight. Eighty-five per cent were below normal standard weight

on admission. A lowered state of nutrition and starvation often affect the mentality, but chiefly in the emotional sphere. Modern metabolism studies serve to emphasize the importance of fat derivatives in the structure of brain tissue. Hence, fat starvation and a great diminution of the stored fats in the tissues cannot fail to affect brain function in some degree. Case studies indicate that a gain in weight must be produced in at least certain mental cases before mental improvement can occur. This is probably true in most cases. An unusual case is reported in which an emaciated woman tripled her weight within one year. The importance of mental hygiene and of a proper insistence on a normal state of body nutrition is emphasized.

Staehelin, J. E. MORAL OLIGOPHRENIA AND SCHIZOIDIA. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXXII.]

Staehelin considers moral oligophrenia causally or conditionally bound with the schizoid mode of reaction. Its manifestations must be much strengthened by syntonie elements mixed with it but "pure" syntonie and moral oligophrenia are mutually exclusive.

Kafka, F. and Hlava, K. BLOOD FERMENTS IN PSYCHIATRY. [Cas. lek. cesk., Nov. 10, 1923. J. A. M. A.]

Kafka and Hlava found a normal antitryptic and amylolytic titer in the serum of manics and depressives. This was in marked contrast to schizophrenias; the latter showed high antitryptic and low amylolytic figures, which resembled their findings in cancer cases. Syphilitic affections of the brain always had increased amounts of antitrypsin and usually also of amylase. They observed a very marked increase of the amylolytic titer in the status epilepticus and in epileptic obnubilation.

Krabbe, K. H. DELIRIUM TREMENS AT COPENHAGEN. [Ug. for Laeger, Sept. 13, Vol. 85. J. A. M. A.]

Krabbe relates that prohibition was decreed in Denmark in 1917. The decree absolutely prohibiting the sale and importation of alcohol was dated Feb. 27, 1917, but in less than a month this decree was revoked, and the only restriction on alcohol then imposed was to raise the retail price of strong liquors about fifteen-fold. People stopped buying liquor then, and the fight against alcohol was won, without restrictive laws. Krabbe presents as evidence to prove these statements the record of cases of delirium tremens at the public hospital at Copenhagen. Whereas, from 1903 to 1916, inclusive, there had never been less than 249 cases of delirium tremens in any year, and the number sometimes reached 447, in 1917 it dropped to 82; to 9 in 1918; 11 in 1919; 18 in 1922. The previous hard drinkers said they could not afford liquor at these high prices, and they left it alone. He reiterates that these facts prove that Denmark is on the right track. Merely by enforcing a very high price for hard liquors, chronic alcoholism became so rare that the

cases of delirium tremens dropped off 95 per cent. He adds that prohibition might have accomplished the same, but with the plan adopted there was no opportunity for conflict with the law, and the profession is grateful that it did not have to contend with the temptation to write prescriptions for alcohol.

Bumke, O. DEMENTIA PRAECOX. [Klinische Wochenschrift, III, 437.] 437.]

The brains of dementia precox patients always present anatomic lesions. Every psychosis corresponds to a pathologic process in a hitherto normal organ. The anatomic basis does not appear to be the same for every case. The anatomic changes indicate the organic nature of a schizophrenic psychosis, but not its disease entity. According to Bleuler, obscure schizophrenia may occur, just as latent tuberculosis may exist until activated. Bumke prefers this explanation to the theory of a schizoid temperament. If dementia precox may be assumed to be an organic process, schizoid psychopathy must be interpreted as an incompletely healed, or abortive form of this disease. The relatives of schizophrenic individuals frequently present not only affective, but also intellectual defects, indicating that the process is organic and exogenous, but not endogenous and functional. Kretschmer admits that the prepsychotic, psychotic and nonpsychotic (schizoid) factors cannot be distinguished. Bumke considers that the cool, passionless individuals, who regard everything calmly, never follow impulses, and who are either cold egoists or useful working machines, are no more schizoid than are the dark, gloomy, reserved and misanthropic natures. However, the combination of hypersensitivity and coolness, or of furious anger and phlegma, *i.e.*, the psychologically unreliable and inconsistent temperament, may be interpreted as typical of schizophrenia. If the disease is present in the case of a brother rather than of the subject himself, the abnormality of temperament must be an abortive form. Opinions differ as to the heritability of dementia precox. At least one form of the disease is definitely transmissible, but this cannot be assumed for all forms of schizophrenia, some of which may be acquired. It is a striking fact that dementia precox is never transmitted through several generations by direct descent, and that transmission from parent to offspring is rare. Two schizophrenic parents do not always produce schizophrenic children. Brothers and sisters are not as frequently affected as would be expected according to the usual laws of heredity. One must therefore assume that some other factor also plays a rôle. It is probable that the disease is determined by two factors: an hereditary, constitutional tendency and an acquired, exogenous, activating factor. The mechanism is probably similar to that of pulmonary tuberculosis, which is due to hereditary tendencies activated by exogenous factors. Every case of dementia precox, whether or not associated with endocrine disturbances, must be based upon organic changes. It is, however, not certain whether or not

schizophrenia represents an organic disease entity, and whether or not every schizophrenic psychosis is due to the same causes and has the same biologic basis. Histopathologic studies of the disease have failed to demonstrate any such uniform pathogenesis. Furthermore, many schizophrenic syndromes occur in diseases other than dementia precox, such as intoxications, infections, diseases of the inner organs and following cerebral trauma.

It may be assumed that the same injury of the cerebral tissue may cause symptomatic psychoses in one case, and an incurable defect in another, and that the clinical manifestations may be similar for some time. This theory is in keeping with the observation that, in apical catarrh, for example, recovery may ensue in one case, and fatal phthisis may develop in another. Many conditions diagnosed as acute hallucinatory confusion, or amentia, have been observed to terminate in schizophrenic idiocy. The severity of the process depends upon the severity of the initial injury, and also upon the resistance of the individual, and his constitutional tendencies.

Elmquist, A. G. J. BOARDING OUT THE INSANE. [Ug. for Laeger, Vol. 85, Sept. 27. J. A. M. A.]

Elmquist reviews the experiences with "family care" of the mild insane in the Djursland district in the last twenty years. The method here differs from that at Gheel and in Scotland in that the families selected reside near the insane asylum, and the supervision of the insane thus boarded out is entrusted to the local general practitioner. At present there are 110 patients thus placed in families in Djursland, which is a farming district on a peninsula. He explains that the family must take the insane patient into its actual family life and work, and both family and patient have to be selected with care. At present, 75 øre (about 20 cents) per day is paid for the lodging, board, washing and mending. The hospital supplies clothes. He describes a few instances of the complete transformation of the insane in the quiet homelike environment. The pride displayed by the family in such a transformation brings new applications for "patient boarders"; the larger the number of families willing to take these charges, the greater the freedom of choice. The local practitioner is the best judge of the conditions in the families. The custom has recently been introduced of having the patients brought back to the hospital once a week for a bath and inspection of the clothing. Some member of the family drives them in, and they bathe and have coffee, and regard it as a kind of picnic.

Wholey, C. C. THE MENTAL AND NERVOUS SIDE OF ADDICTION TO NARCOTIC DRUGS. [Journal A. M. A., Aug. 2, 1924.]

The conclusions reached by C. C. Wholey are based on drug cases appearing in the routine of a general psychiatric practice. He asserts

that drug addiction can never be understood, or successfully handled, until the fundamental difference between the action of the habit-forming drugs and that of other poisons and disease processes is appreciated: The metallic and endogenous poisons produce their destructive effects, in the main, more obviously on the physical organism; these effects are generally demonstrable, and understood. The mental effects are secondary. The narcotic, or habit-forming drugs, on the other hand, produce degenerative effects primarily on the mind and character; these arise early, and are more or less permanent. The effects on the physical organism in the case of narcotic drugs are largely functional, and generally eradicable. Alcohol, in its results, partakes of the nature of both the habit-forming and the non-habit-forming poisons mentioned. Morphine produces its most serious effects through its action on the vegetative nervous system. Habit-forming drugs induce a distortion of normal reflex activities in both sensory and psychic spheres. The substitution of a psychopathic status is maintained by increasing the obtunding drug to offset the ever decreasing compensatory effects of the organism. Because of the overwhelming dependence of instinctive and emotional life on visceral and endocrine functioning, instinctive and character deviations follow prolonged disturbance of their activities with more or less permanent changes resulting in the entire personality. This mechanism is the essential lesion in narcotic addictions. The observation of a routine series of approximately 1,500 narcotic drug addicts, many of whom were persons of superior intelligence, convinces Wholey that this is essentially a neuropsychiatric problem. The greater number of habitués have drifted into narcotism because of inherent mental instability; the majority of all addicts have become victims during adolescence, before character, even in normal youth, could become stabilized. A small minority have succumbed through therapeutic necessity. The acquiring of the habit is only in rare instances a matter of individual responsibility. Such facts, viewed in connection with the deep-seated and intricate invasion of the personality by the drug, make it clear that decisions as to curability and as to treatment are for the physician. Drug addiction is at present an outstanding social problem. It is only through scientific and unprejudiced understanding of the matter that society can be protected against this insidious menace, with its increasing army of inadequates and their train of poverty and crime. Society will have to approach this problem in the end as other disease problems have been approached; we eliminate typhoid, not by putting responsibility up to the individual, but by abolishing the source of infection. Drug infection, as well, will have to be attacked at its source, whether that source lies in the greed of individuals or in that of governments.

BOOK REVIEWS

Antheaume, A. LE ROMAN D'UNE ÉPIDÉMIE PARISIENNE. [Le Vol à l'étalage, Gaston Doin, Paris.]

The daily press shrieks in headlines about an "epidemic of crime." There are certain naïve creatures who believe it is confined to the United States, but from the casual glimpsing of this little monograph it seems to be universal, *i.e.*, so far as "civilized" countries are concerned. Paris, Rome, Buenos Aires, etc., etc., vie one with another in this special bit of anti-social behavior, to say nothing of the grand scale, major types which lie behind the soviet ethics or the Teutonic deflation tricks.

Dr. Antheaume, however, does not essay to deal with all of the manifestations of the bellum and post-bellum ego-regressions; he here has hastily prepared a protest against that special form of petit larceny which in France has given rise to a great deal of excitement as exemplified in shoplifting.

He is much wrought up as a medico-legal expert, for he has had a large experience as a psychiatrist, with the tendencies of the French courts to be lenient with this class of offenders under the guise of what he does not believe in, *i.e.*, the diagnosis of "kleptomania," which would seem to carry with it a mitigated responsibility or even lean towards a conception of irresponsibility.

We sympathize with him even if we are not prepared to be convinced by his trenchant argument, that "thieving is thieving" and that's all there is to it.

This shoplifting, curiously enough, he finds to be only a specially feminine pursuit, which has become an epidemic in Paris, and is an exclusively Parisian product, not to be found in London nor in Buenos Aires—why he picks out this South American capital we are unable to find out from his book—and which his book would attempt to analyze. The poor, in Paris, he states, steal to nourish their hungry children, and the rich to satisfy their love of coquetry.

Much as we respect the many accomplishments of the editor of the *Annales Medico-Psychologiques*, who has guided it successfully for many years, this amusing little volume carries little conviction as to the many complexities bound up in the behavioristic reaction of shoplifting.

Legrain. LES GRANDES NARCOTIQUES SOCIAUX. [A. Maloine, Paris.]

In a sweeping gesture which would include opium, tobacco, and alcohol, the author contributes this so-called "study" and indictment..

Historically he traces the development of the increase in the use of these voluptuarial agencies, but his book is chiefly devoted to the problem of alcoholism.

Opium is discussed in about fifty pages. It is a soapbox speech that says nothing except what anyone with a rudimentary knowledge knows. Only one feature is worth calling attention to and that is how England passes the buck concerning the opium traffic in China. Even this is only half glimpsed by the author.

Tobacco is finished in eighteen pages. It is illuminating to know it is a parasitic type of poison "purely voluptuous." How it can be pure and voluptuous at the same time the author explaineth not.

From pages 92-400 and a few more we hear a lot of drivel about alcoholism. Simply because alcohol appears on the dinner table, that is the curse.

As reviewer we neither drink, smoke, nor take opium, save occasionally when we want to, have to, or suffer from a toothache when morphine would be welcomed; never having had a toothache, we have certain reservations here. At the same time, cautiously and experimentally having tried all three and still finding ourselves neither in hell or heaven, we are more provoked than amused at these 400 pages of rubbish which the author would present on the basis of thirty-three years of experience.

Whereas we are perfectly willing to admit that any or all kinds of self-indulgence is to be subject to some moral restraint, we are of the firm opinion that the survival of the fittest will only arrive in the free use of any or all environmental stimuli. With a certain radical flair we might almost predict that some years from now, many it must be, only one who can drink the most, smoke more, and dope the deepest and still be socially valuable, will be of the most service to mankind. In other words, the prohibitionist, in no matter what sphere he may operate, suffers from delusions of grandeur and wants to run the universe. Such are made of the stuff that made "God" in "*his*" image; "I" am "God" is an ineradicable part of their make-up.

Siemens, H. W. RACE HYGIENE AND HEREDITY. TRANSLATED AND EDITED BY L. F. BARKER. [D. Appleton & Co., New York and London.]

Among the works dealing with heredity and the which has already been reviewed in these columns, this small volume of Siemens' is of special value. We welcome its appearance in English translation and congratulate Dr. Barker upon his meritorious work in bringing it to the English speaking public.

Benon, R. LA MÉLANCHOLIE. CLINIQUE ET THERAPEUTIQUE. [Chez Gaston Doin, Paris.]

Encompassed within 154 16mo. pages, the author presents a very simple, straightforward account of what he conceives to be "melancholia." It is something to be distinguished from a periodic asthenia, hypochondria, neurasthenia from overwork, secondary neurasthenia

from infections, from boredom, or from an anxious hypothyria. He would abstract it as a syndrome developing upon the basis of disappointment, showing sadness and accompanied by delusional ideas of self-accusation, of culpability, of ruin, of damnation, etc., with absurd illusional and hallucinatory interpretative formulae. Major and minor forms are described, delusional or not, suicidal or not, and usually curable by "moral" therapeutic measures and a sympathetic and kind environment.

How far removed the author is from the current stream of psychiatric thought it is impossible to conceive from this short résumé. That his historical résumé stops with Kraepelin's 1898 conceptions is sufficient to indicate that the book, if not the author, has not entered into the new century, or if he has, has no belief in it. Contemporary psychopathology has no place here.

Baumann, E. D. DE HEILIGE ZIEKTE: EEN BIJDRAGE TOT DE GESCHIEDENIS DER GENEESKUNDE IN DE OUDHEID. [Nijgh & Van Ditmar's Uitgevers-Maatschappij, Rotterdam.]

In many senses it is to be regretted that so valuable a book upon the description of epilepsy by the ancients should appear in a language so little understood by the world at large.

Fortunately for those interested in this very pressing subject, an author's autoreferat is available in German in "Janus," Vol. 29, 1925, p. 7. Here it appears that the author has gone back to early Greek sources not only concerning the Hippocratic appellation but also as to the Greek's ideas about the situation in general. Herodatus was one of the earlier commentators and Kambuses seemed to be afflicted with the disease. Democritus and Heraclitus also had some interesting things to say. The attack of Hercules when he killed his sons is well discussed. These older and later authors are quoted by the erudite author, much attention being given to Aurelius of Cappadocia.

The author has taken us to the time of the Romans. We know of no more careful discussion of epilepsy as conceived by the ancients than this interesting monograph.

Queoli, Nels. ENZYME INTELLIGENCE AND WHENCE AND WHITHER. [The Colwell Press, Inc., Minneapolis, Minn.]

One may well ask, Whence and Whither? Were this book not dedicated to a son, which after all is the whence and whither of every parent, we might say fudge! But after all 578 pages of octavo type, no matter who paid for it, is at least entitled to some sort of examination, even if on first opening it seems a mess.

At least the title page makes us pause. "Illustrating that enzymes and ferments are the ultimate indestructible and invisible units of life and are conscious and intelligent. That these units produce and maintain all living things we see. That our body is a Republic established by enzymes coming from the invisible world of life to which we return when we die."

This is certainly a large order. It is within the personal ken of the reviewer that he read and reviewed an earlier work of this author, a pharmacist who was interested in solving the mysteries of life. It was called "Cell Intelligence." Although the author knew nothing(?) of Semon or Samuel Butler, or of Aristotle, still he glimpsed something of Mnemic Inheritance, of Unconscious Memory, and of Entelechy, three terms utilized by the authors respectively as envisaging what Queoli was trying to express. How much he may have known of these writers is not known—he may have cribbed from them and kept silent about it—at all events he circled about the ideas, and really stated nothing that had not been said before—even if he himself had not known it had been so stated. Thus we have no special interest in his self-laudation in his Preface.

In a word this work impresses us as that of a very curious and hard reading individual who has attempted to assimilate a vast amount of erudition and call it his own.

It is a hodge podge about a whale of a lot of things, attributed to the enzyme but which has come mainly from the Carnegie library. We may be all wrong, but this is what we gather, and we suspect the author is not altogether sure of what it all signifies by any means.

Bentley, Madison. *THE FIELD OF PSYCHOLOGY.* [D. Appleton & Company, New York and London.]

The subtitle of this work tells us precisely its boundaries—a survey of experience, individual, social and genetic. This certainly is large enough a field to survey in and it is surprising to see how clearly the author has run his lines and mapped out the special sectors.

In short, it is an admirable psychological treatise from a fresh angle and as such is entitled to a wide reading. Here and there we detect faulty clearing of the field. Thus the author's conception of Freud's "repression" is quite lopsided. He sees only one side of the conflict and overlooks the difference between sublimation and reaction formation and the dynamic potential at the service of the Super Ego and of society as a resultant of healthy repression. There are a lot of small discrepancies in this survey, but in the main it is a very useful topographic outlay of an important field in which all neuropsychiaters are interested.

Spadolini, Igino. *LE FUNZIONI NERVOSE NEL SISTEMA DELLA VITA VEGETATIVA.* [Nicola Zanichelli, Bologna.]

This is an excellent contribution to the subject of the vegetative nervous system from the physiological laboratory in Florence. The author speaks of the lack of works upon the subject. We suspect he has overlooked Pende's classic, but this apart, he has given an excellent résumé, accenting specially the physiological aspects of the problems involved. The chapters upon internal sensations and upon the vegetative nervous system and metabolism are specially interesting. Although hardly more than a sketch (156 pages) when compared with Laignel-Lavastine's classic, it nevertheless contains some excellent material.

Easterbrook, C. C. MENTAL INVALIDS. [Oliver and Boyd, Edinburgh. 5 sh.]

These are the three Morison Lectures delivered before the Royal College of Physicians of Edinburgh in June, 1925, and reprinted from the Edinburgh Medical Journal.

Easterbrook is superintendent at the Crichton Royal Hospital at Dumfries and is a veteran in the psychiatric field. Although a veteran he is keenly alive to modern problems and we welcome these lectures in this convenient form.

Hingley, R. H. PSYCHOANALYSIS. Second Edition. [Methuen & Co., London. Dodd, Mead & Co., New York. \$2.25.]

In Vol. 57, 1923, we reviewed the first edition of this work, commending it in general. This second edition does not seem to have been altered much. We can repeat this is an excellent general exposition of the general principles for the layman. It is not a technique for the doctor.

Laforegue, R. LE RÊVE ET LA PSYCHANALYSE, AVEC LA COLLABORATION DES DOCTEURS ALLENDY, ED. PINCHON ET R. DE SAUSSURE. [Norbert Maloine, Paris.]

This is a work of collaboration which, including an interesting and lengthy introduction by Dr. Hesnard, a former adverse critic of psychoanalysis but now one of France's leading exponents, has the names of five French psychoanalysts in its make-up.

This is in reality an original work upon the Dream rather than a translation of Freud's works, or a reëditing of the many available documents of other languages.

The authors have taken their material directly from the clinic or from their private clientele.

Dr. Hesnard has written a very illuminating essay upon the general psychological setting of the dream and has contributed a number of interesting examples. Dr. Allendy has contributed a delightful chapter upon the history of antique and popular conceptions of the dream. It is of special interest because of its rich collection of ideas from French sources and offers an excellent supplement to the splendid history to be found in Freud's Interpretation of Dreams. Further, Allendy has gone further back into antiquity for his material than Freud has done and thus afforded an excellent historical résumé of the whole subject.

De Saussure carries the story into the 18th and 19th centuries and presents a complete picture of the French Tradition. These chapters comprise the general part of the book (60 pp.). Technical chapters follow.

Allendy first writes upon the general character of the dream, de Saussure details the Freudian conceptions, Allendy then takes up Significance and Interpretation, and Laforegue deals with Transference.

A third part of the book deals with clinical considerations, Pinchon and Laforegue writing upon the Dream and the Neurosis

and the Conception of Schizonoia, which conception Laforgue deals with more in detail in a final chapter.

The work is distinctly original and is well worth while. It is one of the first French works of a special class, in a sense comparable to the many studies of the Freudian school. As such it is to be commended.

Flick, Lawrence F. DEVELOPMENT OF OUR KNOWLEDGE OF TUBERCULOSIS. [Philadelphia, 738 Pine St. \$7.50.]

This is a big—yes, a very big book. It has pages and pages, but they are filled with interesting material. Dr. Flick traces the history from the Code of Hammurabi, through the days of Moses and his people, the Greeks, the Latins, and on through the centuries up to the period of Virchow, Pasteur, and Koch.

It is all full and explicit and scholarly, and little from the somatic side has been left out. It is complete up to the beginning of the century. Of the bacteriological, pathological, and immunological work since 1900 there is nothing. Dr. Flick partly promises to supply this.

Of the human being who is susceptible, or why he is susceptible, or of other factors than purely mechanistic ones, there is not a trace, particularly nothing of the psychological factors which may be of great importance in aiding, abetting, or permitting infection.

This will perhaps be the chapter to be written in the year 1950 or 2000, but it is bound to come, for after all the tubercle bacillus may be necessary, but what of the soil, *i.e.*, the organism as a whole?

Schulz, Hugo. SIMILIA SIMILIBUS CURANTUR. 3d Auflage. [Otto Gmelin, München.]

As is well known, since Bier, the surgeon, became an advocate of Hahnemannian therapeutics there has been a great rumpus in Germany pro and con re homeopathy. The present small brochure is one of the pros. It is interesting as a historical document, but like the whole movement, a lamentable lack of information about the vegetative nervous system has permitted an enormous amount of futile discussion.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

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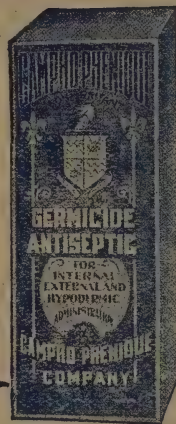
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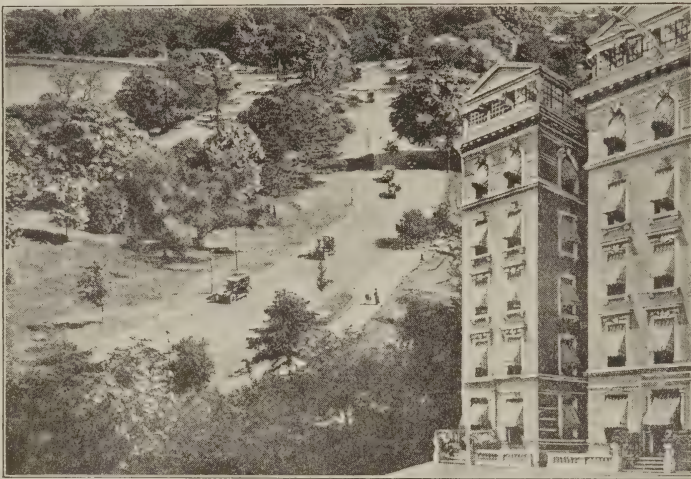
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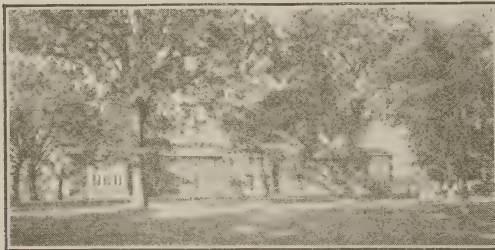
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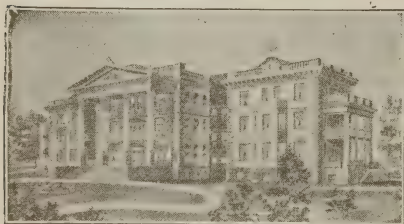
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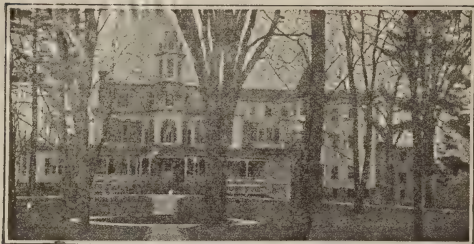
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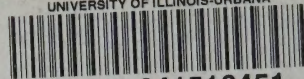
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